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Four new species of Orchidaceae from Western Australia

By A. S. George

Abstract

Three species of *Caladenia* are described—*C. corynephora* sp.nov., *C. crebra* sp.nov. and *C. graminifolia* sp.nov.—and one species of *Pterostylis*—*P. angusta* sp.nov.

Introduction

As a result of checking the correct application of all the names which have been applied to Western Australian Orchidaceae, it has become clear that a number of taxa are undescribed. While many belong to confused groups which require detailed revision the four described here are quite distinct and are published so that the Checklist which follows this paper may be more complete.

Caladenia corynephora A. S. George, sp.nov. (Figure 1)

Planta gracilis ad 45 cm alta. Folium lineare, 15–30 cm longum, supra glabrum infra hirsutum. Caulis hirsutus bracteis duobus acutis 20–25 mm longis. Flores 1–2, citrino-viridis et atro-ruber. Perianthium parce glanduloso-hirsutum segmentis rubri-nervosis et glanduloso-clavatis omnibus. Sepala 22–32 mm longa; dorsale erectum, leviter incurvum, lineare, clava 5–8 mm longa; lateralis patentia vel saepe ad apices unum super alium transitum, lineari-falcata, clavis 8–11 mm longis. Petala 20–25 mm longa, patentia, linearia, leviter falcata, clavis 4–7 mm longis. Labellum pallide viride antice atro-rubrum, late-ovatum, acutum, 13–17 mm longum, 8–10 mm latum (sine fimbriis), in ungue 1–2 mm. longo insertum; margines fimbriis laevibus filiformibus ad 9 mm longis antice brevioribus claviformibus ornati, apex integer glandulosus ochraceus (clavis perianthii similis); calli 4-seriales, ex ungue labelli per 8–10 mm extensi, crassi, fere carnosí, parum clavati. Columna 14–16 mm longa, erecta, incurva, ad basin anguste-alata, supra medium late-alata, ad basin glandulis duobus flavis. Anthera \pm 4 mm longa, mucronata. Stigma ovatum. Ovarium dense glanduloso-hirsutum.

Type: Banks of the Donnelly River = 15 miles west of Pemberton, W.A., A. S. George s.n. Dec. 7, 1957—holo.: PERTH, iso.: MEL, K.

A slender plant to 45 cm tall. Leaf linear, 15–30 cm long, glabrous above, hirsute below. Stem hirsute, with a bract near the middle and one below the ovary, both acute, 20–25 mm long. Flowers one or two, yellow-green and dark red. Perianth sparsely glandular-hirsute, all segments with red nerves and glandular clubs. Sepals 22–32 mm long; dorsal sepal erect, slightly incurved, linear, with a club 5–8 mm long; lateral sepals spreading or crossed in front, linear-falcate, with clubs 8–11 mm long. Petals 20–25 mm long, spreading, linear, slightly falcate, with clubs 4–7 mm long. Labellum pale green, anteriorly dark red, broadly ovate, acute, 13–17 mm long, 8–10 mm broad (without the fringe), on a claw of 1–2 mm; margins fringed with smooth, filiform fimbria up to 9 mm long, the fimbria shorter and clavate anteriorly; apex entire, glandular, golden-brown (like the clubs of the perianth); calli in 4 rows extending for 8–10 mm from the claw, thick, almost fleshy, somewhat clavate. Column 14–16 mm long, erect, incurved, narrowly winged at the base, broadly winged above the middle, with two yellow glands at the base. Anther \pm 4 mm long, mucronate. Stigma ovate. Ovary densely glandular-hirsute.

The affinities are with *Caladenia radiata* Nicholls, *C. longiclavata* Coleman and *C. dilatata* R.Br. The species differs from these in the long leaf which is glabrous on the upper surface, the club-like apex of the labellum and the

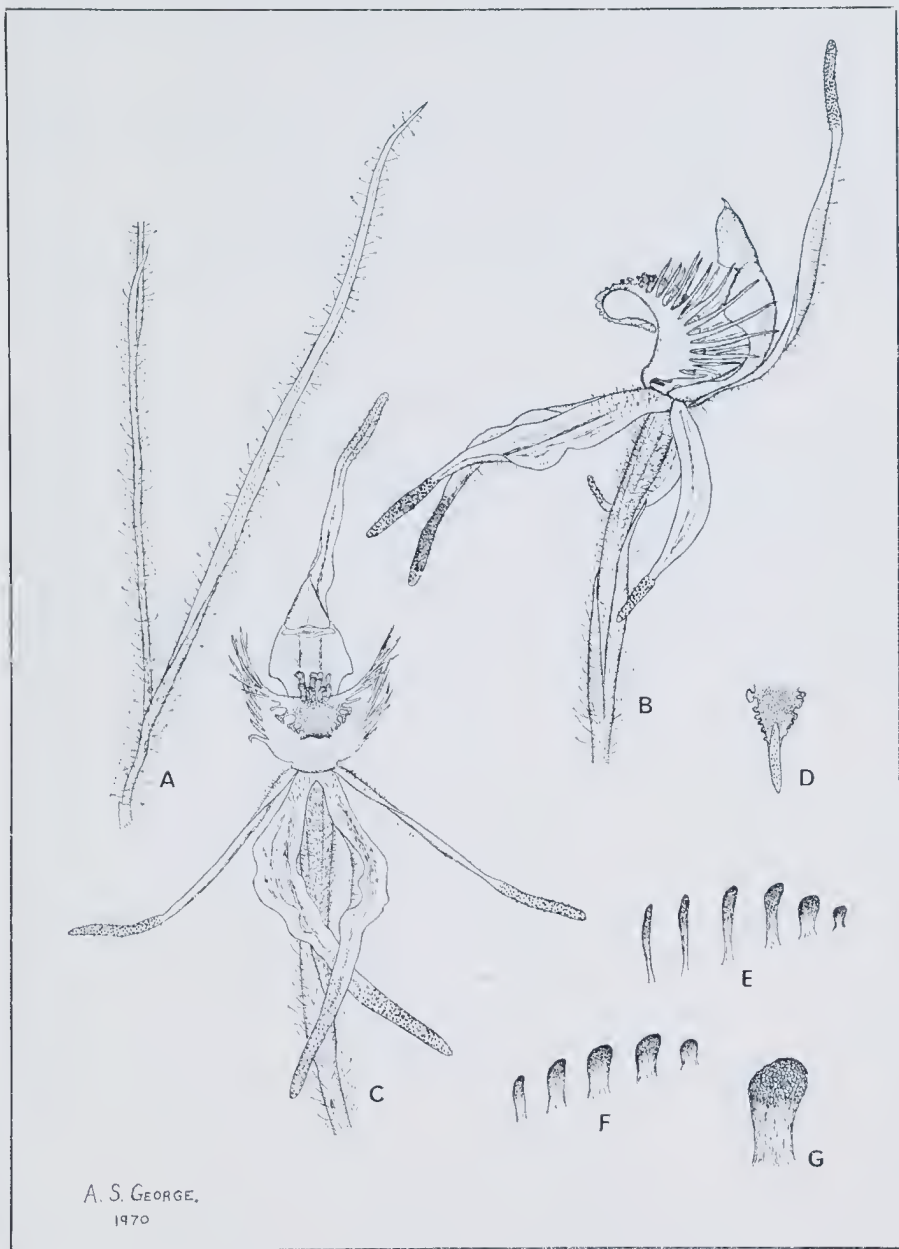


Figure 1—*Caladenia corynephora* sp. nov. A—Leaf and base of stem, $\times 0.5$. B, C—Flower, $\times 1.5$. D—Apex of labellum showing "club". E—Calli, $\times 4$. F—Calli, $\times 3$. G—One callus, $\times 6$. A to E from George 6466; F from Donnelly River, George, Dec. 7, 1957; G from Margaret River, Fletcher, Nov. 25, 1959.

thick, almost fleshy calli. *C. radiata* has longer perianth segments, the sepals being 35-55 mm long, and acuminate petals. All the varieties of *C. longiclavata* have a much shorter fringe on the labellum, and the fimbria are often finely scabrid. *C. dilatata* has larger lateral lobes on the labellum, and the petals are not clubbed.

The species flowers in late November and December two to three weeks later than *C. radiata*, at least one month later than *C. dilatata* and two months later than *C. longiclavata*. It is the last of the Western *Caladenias* to flower each season. The specific epithet, meaning "club-bearing", refers to the clubs on all perianth segments as well as the labellum.

Other collections examined: Bank of the Margaret River, *K. Fletcher*, Nov. 25, 1959 (PERTH); Warren River near Jarnadup (now Jardee), *Miss I. Knox-Peden*, Dec. 29, 1918 (AD); 15 miles west of Albany, in jarrah forest near swamp, *A. S. George* 6466, Dec. 7, 1964 (PERTH); Albany *R. Oliver*, Dec. 12, 1962 (PERTH).

Caladenia crebra A. S. George sp. nov. (Figure 2)

Planta gracilis 25-45 cm alta. Folium lineare, \pm 20 cm longum, utrinque hirsutum. Caulis hirsutus, bracteis duobus acutis 17-25 mm longis. Flores 1-2, flavido-virides et atro-rubri. Perianthium extus glanduloso-hirsutum, etiam intus versus basin. Sepala 25-45 mm longa; dorsale erecto-incurvum, lineare, acuminatum, non clavatum; lateralia patentia, lanceolata-acuminata marginibus inferioribus saepe parum undulatis, apicibus non clavatis sed atro-glandulosi. Petala patentia, lineari-falcata, acuminata, 25-35 mm longa. Labellum late rhombeum ad transverse ovatum, \pm 15 mm longum, 10-12 mm latum (sine fimbriis), apice acuto recurvo; margines fimbriis filiformibus subtiliter scabridis ad 6 mm. longis antice brevioribus interdum uncinatis ornati; apex \pm integer, nudus; calli atro-rubri, zona lata ex ungue confertissimi, lineares, parum uncinati, 4 mm longi, antice breviores. Columna 15-18 mm longa, ad basin fere horizontalis anguste-alata, deinde sursum valde curvata late-alata; ad basin glandulis duobus flavis. Anthera 4-5 mm longa, mucronata. Stigma late-ovatum. Ovarium dense glanduloso-hirsutum.

Type: 24 miles south of Dongara, W.A., in sandy soil with *Eucalyptus erythrocorys* and scrub *A. S. George* 9621, Aug. 30, 1969—holo.: PERTH, iso.: K, MEL, NSW.

A slender plant 25-45 cm tall. Leaf linear, \pm 20 cm long, hirsute on both sides. Stem hirsute, with two acute bracts 17-25 mm long. Flowers one or two, yellow-green and dark red. Perianth glandular-hirsute outside, and inside towards the base. Sepals 25-45 mm long; dorsal sepal erect-incurved, linear, acuminate, not clubbed; lateral sepals spreading, lanceolate-acuminate, lower margins often slightly undulate, apices not clavate but covered with short dark glands. Petals spreading, linear-falcate, acuminate, 25-35 mm long. Labellum broadly rhombic to transversely ovate, \pm 15 mm long, 10-12 mm broad (without the fringe), with an acute, recurved apex; margins fringed with filiform, finely scabrid fimbria up to 6 mm long, the fimbria becoming shorter anteriorly, sometimes uncinata; apex \pm entire, bare; calli dark red, very crowded in a broad band from the claw, linear, somewhat uncinata, 4 mm long, shorter anteriorly. Column 15-18 mm long, almost horizontal and narrowly winged at the base, then strongly curved upwards and broadly winged; two yellow glands at the base. Anther 4-5 mm long, mucronate. Stigma broadly ovate. Ovary densely glandular-hirsute.

This species belongs to the Section *Calonema* and is at once distinguished from all other species of the Section by the very dense band of linear calli. It is also unusual to find the apices of the lateral sepals covered with glands while the dorsal sepal is not; in other species the sepals are either all glandular-clubbed or all smooth. The closest affinity appears to be with *Caladenia radiata* Nicholls, which has a longer, narrower labellum and thicker, less crowded calli. The only other species of the Section with crowded, linear calli is *C. lobata* R. Fitzg., but even there they are thicker and much less dense than in *C. crebra*, while the flower is larger, with upturned lateral sepals, and the labellum has large lateral lobes.

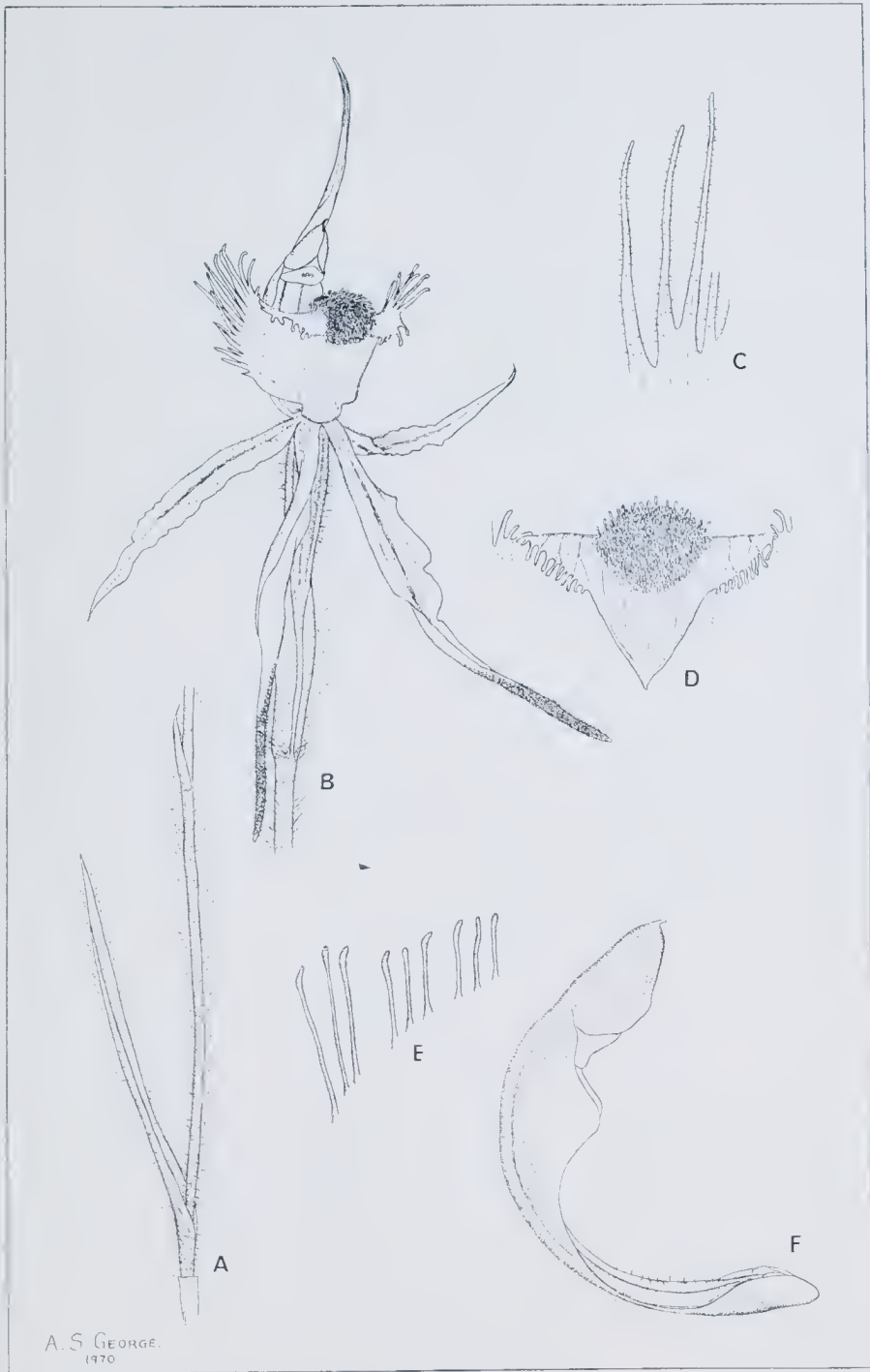


Figure 2—*Caladenia crebra* sp. nov. A—Leaf and base of stem, x 0.6. B—Flower, x 1.5. C—Marginal fimbria of labellum. D—Apex of labellum. E—Calli, x 4. F—Column, x 3. All from George 9621.

Caladenia crebra was discovered by Mrs. E. Summers of "Green Grove" south of Dongara, and was brought to my attention by Mr. A. C. Burns of Geraldton. It is known from a relatively small area but is locally common and may be found in similar habitats along this coastal strip. The specific epithet, meaning "close, pressed together", refers to the dense calli on the labellum.

Other collections examined: Arrowsmith River area, south of Dongara, W.A., A. C. Burns, Sept. 10, 1967; loc. id. Sept. 15, 1968; loc. id. Aug. 28, 1969 (all at PERTH).

***Caladenia graminifolia* A. S. George, sp. nov. (Figure 3).**

Planta gracilis 12-30 cm alta. Folium lineare, acutum, 10-15 cm longum, supra glabrum infra sparsim pilosum. Caulis hirsutus duobus bracteis, altera ad medium, altera infra ovarium idemque saepe amplectente inserta. Flores 1-2, pallide citrino-virides et atro-rubri. Sepala 22-35 mm longa clavata; dorsale erectum, leviter incurvum, lineari-subulatum, clava 3-5 mm longa atro-glandulosa; lateralia + leviter pendula, saepe ad apices unum super alium transitum, falcata-linear, apicibus clavatis 5-8 mm longis. Petala patentia, lineari-subulata, non clavata, 18-25 mm longa. Labellum pallido-viride apice atro-rubro, angustovatum, 10-14 mm longum, 4-6 mm latum (sine fimbriis) in ungue 1-2 mm longo insertum; margines supra basin fimbriis laevibus subulatis ad 6 mm longis ornati; apex obtusus, non recurvus, marginibus incurvis \pm integris; calli atro-rubri, 2 vel 4-seriales, in quoque serie 6-8 callis per $2/3$ longitudinis labelli extenso, basales angusti, antice crassiores, clavati (interdum conjuncti). Columna 12-13 mm longa, erecta, incurva, ad basin anguste-alata, supra medium late et obtuse alata alis ad 3 mm latis; ad basin columnae glandulis duobus flavis. Anthera \pm 3 mm longa, mucronata. Stigma parvum, ovatum. Ovarium dense glanduloso-hirsutum.

Type: Culham Inlet, west of Hopetoun, W.A., in sandy soil under *Eucalyptus platypus* var. *heterophylla*. A. S. George 9468, Aug. 1, 1969—holo.: PERTH, iso.:K, MEL, NSW.

A slender plant 12-30 cm tall. Leaf linear, acute, 10-15 cm long, upper surface glabrous, lower sparsely pilose. Stem hirsute, with two bracts, one near the middle, the other below the ovary and often embracing it. Flowers one or two, pale greenish-cream and dark red. Sepals 22-35 mm long; dorsal sepal erect, slightly incurved, linear-subulate, with an apical dark-glandular club 3-5 mm long; lateral sepals somewhat pendulous, often crossed in front, falcate-linear, with clubbed apices 5-8 mm long. Petals spreading, linear-subulate, not clubbed, 18-25 mm long. Labellum pale green with a dark red apex, narrow-ovate, 10-14 mm long, 4-6 mm wide (without the fringe), on a claw of 1-2 mm; margins fringed above the base with smooth, subulate fimbria up to 6 mm long; apex obtuse, not recurved, with incurved \pm entire margins; calli maroon, in 2 or 4 rows, each row with 6-8 calli extending for $2/3$ the length of the labellum; basal calli narrow, upper ones thicker and clavate, occasionally fused. Column 12-13 mm long, erect, incurved, narrowly winged at the base, broadly and obtusely winged above the middle with wings up to 3 mm broad; two yellow glands at the base of the column. Anther \pm 3 mm long, mucronate. Stigma small, ovate. Ovary densely glandular-hirsute.

This is most closely allied to *Caladenia dilatata* R.Br., differing in the following points: the slender leaf which is glabrous above; the smaller flower; the labellum which is much narrower, without large lateral lobes, the apex being not recurved, and the calli usually in two rows of 6-8 each; and the more gently curved column. At one locality, near Kundip south of Ravensthorpe, *C. graminifolia* and *C. dilatata* var. *falcata* Nicholls occur near each other but do not intergrade.

The species is common in coastal areas or a little inland between Culham Inlet (just west of Hopetoun) and Esperance, on the south coast of Western Australia. The specific epithet refers to the grass-like aspect of the leaf.

Other Collections examined: Ravensthorpe, Mrs. V. M. Bennett, Aug. 1968; Culham Inlet, west of Hopetoun, A. S. George 60, Aug. 17, 1958; 3 miles E. of Hopetoun, Mrs. V. M. Bennett, Aug. 1969; South of Kundip, south of Ravensthorpe, A. S. George 5778, Aug. 31, 1963; Circle Valley-Rcd Lake, C. F. Davies 97, Dec. 1962 (in seed) (all at PERTH).



Figure 3 *Caladenia graminifolia* sp. nov. A—Leaf, $\times 0.6$. B—T.S. lower part of leaf to show distribution of indumentum. C, D—Flower, $\times 1.4$. E—Apex of lateral sepal. F—Calli. G—One callus. H—Column, $\times 3.5$. All from George 9468.

***Pterostylis angusta* A. S. George sp.nov. (Figure 4)**

Planta gracilis 10–20 cm alta. Caulis foliatus, parum flexuosus, subtiliter scabridus. Folia 3–7, amplexicaulia, late lineari-lanceolata, acuta, 15–30 mm longa. Folia plantarum juvenilium rosulata, petiolata, late trullato-ovata, acuta, ad 25 mm longa. Flos 1 (raro 2) albo-translucens atro-fuscoviridi vittatus. Galea 13–16 mm alta ad apicem prorsum et leviter deorsum curvata. Sepalum dorsale supra basin gibbosum (ubi 5·5–6·5 mm latum), superne angustatum naviculare (ubi 3–3·5 mm latum) apice acuto non mucronato. Petala longa fere quam sepalum dorsale, falcata, acuta, supra basin margine postice obtuse-angulato. Sepala lateralialia erecta, 18–30 mm longa, per 9–11 mm connata ubi angustie oblongo-rhombea ad 7 mm lata, in apices filiformes angustata; sinus inter sepala parum acutus marginibus involutis. Labellum breviter unguiculatum, lineare, planum vel parum concavum, non constrictum, ad apicem acutum sensim angustatum etiam prorsum et deorsum per sinum sepalorum curvatum; appendix basalis cristata. Columna 12–13 mm alta, cum sepalo dorsale per 2–3 mm connata, alis oblongo-auriculatis auriculis basalibus obtusis intus barbatis, auriculis superis acutis. Anthera 1 mm longa. Stigma oblongum, 2 mm longum, ad basin obtusum supra angustatum.

Type: West of Mt. Trio, Stirling Range, W.A., in clay-quartzite soil in wandoo woodland, A. S. George 9480, Aug. 2, 1969—holo.: PERTH, iso.: K, MEL, NSW.

A slender plant 10–20 cm tall. Stem leafy, slightly flexuose, finely scabrid. Leaves 3–7, amplexicaul, broadly linear-lanceolate, acute 15–30 mm long. Leaves of juvenile plants rosetted, petiolate, broadly trullate-ovate, acute, up to 25 mm long. Flower one (rarely two), translucent-white banded with dark brownish-green. Galea 13–16 mm tall, curved forwards and slightly downwards towards the apex. Dorsal sepal gibbous above the base where 5·5–6·5 mm broad, narrowed and navicular above where 3–3·5 mm broad, with an acute, not mucronate apex. Petals almost as long as the dorsal sepal, falcate, acute, with an obtusely angular lobe on the posterior margin above the base. Lateral sepals erect, 18–30 mm long, united for 9–11 mm where narrowly oblong-rhombic, up to 7 mm broad, narrowed into filiform apices; sinus between the sepals rather acute with involute margins. Labellum shortly clawed, linear, flat or slightly concave, not constricted, gradually narrowed to an acute apex, curved forwards and downwards through the sinus of the sepals. Column 12–13 mm high, united with the dorsal sepal for 2–3 mm, with oblong-auriculate wings, basal auricles obtuse and bearded inside, the upper ones acute. Anther 1 mm long. Stigma oblong, 2 mm long, obtuse at the base, narrowed above.

This species has affinity with *Pterostylis alata* (Labill.) Reichb. f., *P. scabra* Lindl., and related species but may be distinguished by the small flower and the very narrow galea. The petals are much narrower in their upper half than those of *P. alata* and *P. scabra*, and it is largely this which gives the galea its narrow form. The lateral sepals are also narrower than in the other species. *P. alata* has a shorter, erect, non-protruding labellum, as do some forms of *P. scabra*, while in the typical variety of *P. scabra* the labellum has a constriction where it bends forward.

The species has been found in the Bunbury district, between Broomehill and Kendenup, and in the Stirling Range. The Staer specimen from "Perth" probably has a general locality given to a collection from the south-west of Western Australia.

The specific epithet refers to the narrow aspect of the flower.

Other Collections examined: Perth, J. Staer, Aug. 1905 (E); Bunbury, Mrs. F. M. Coate (PERTH); 9 miles south of Bunbury, A. S. George 5, July 5, 1959 (PERTH, MEL); loc. id., A. S. George 866, July 2, 1950 (PERTH, AD); 11 miles south of Bunbury, A. S. George 9, July 5, 1959 (PERTH); Broomehill, T. Carter (PERTH); 12 miles S.W. of Broomehill, A. S. George 9493, Aug. 3, 1969 (PERTH); 6 miles N.E. of Kendenup Siding, A. S. George 9483, Aug. 2, 1969 (PERTH); W. Australia, Brewer 1878 (K).

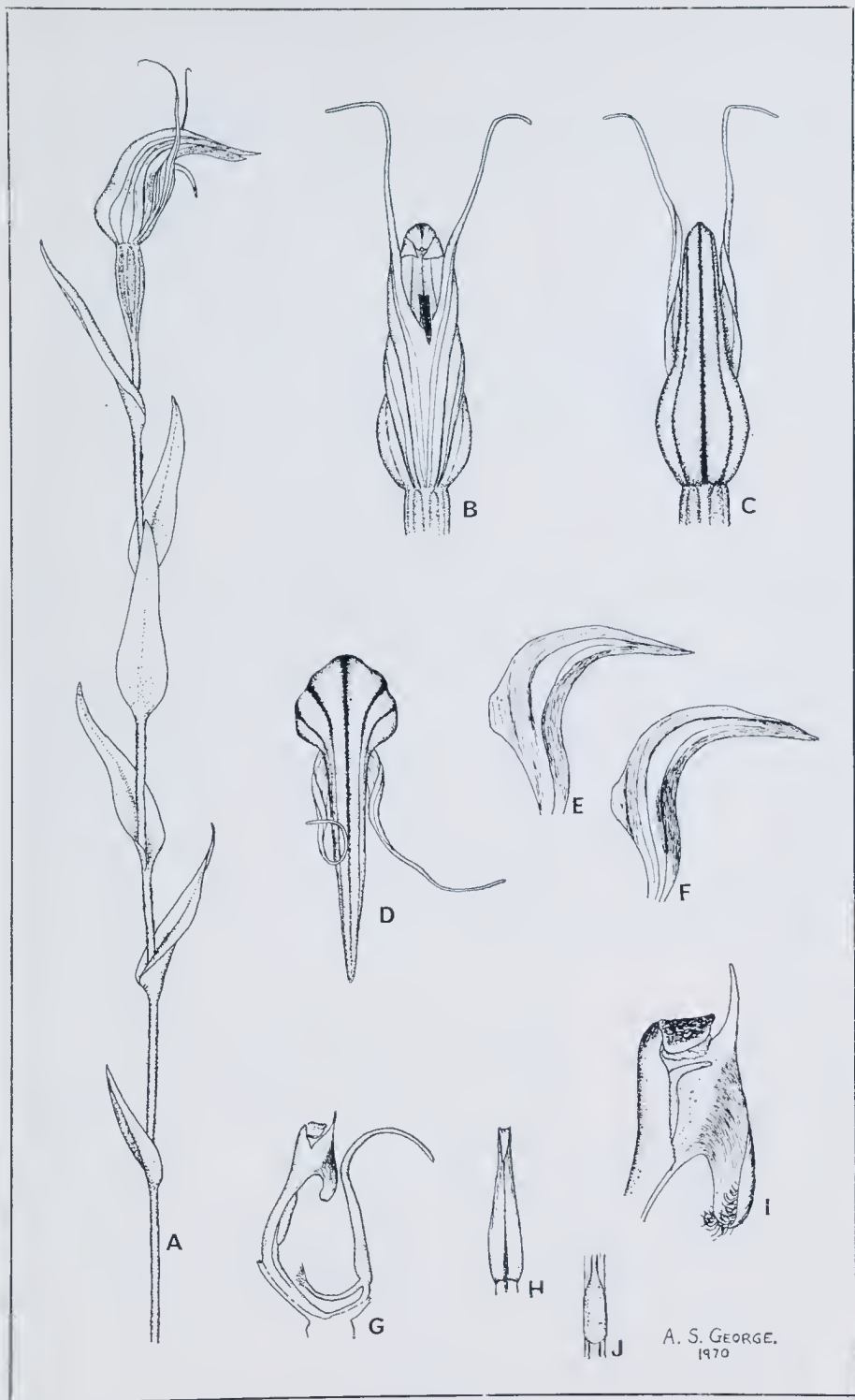


Figure 4—*Pterostylis angusta* sp. nov. A—Plant, x 1.2. B, C, D—Flower, x 2.3—B from front, C from rear, D from above. E, F—Petals, x 2.2. G—Column and labellum, x 1.7. H—Labellum from front, x 1.7. I—Apex of column with one wing removed. J—Stigma. All from George 866.

A check list of the Orchidaceae of Western Australia

By A. S. George

Abstract

The List includes all names which have been applied to Western Australian Orchidaceae and gives original citations, type collections and their location. Of a total of 297 names (including combinations) of specific or infra-specific rank, 148 are here accepted as correct including 20 of infra-specific rank, while 15 are considered to have been incorrectly recorded for this State.

One new generic name is proposed—*Leporella* gen. nov. to replace *Leptoceras* R. Fitzg. non (R. Br.) Lindl.

Ten new combinations are made, and 25 names which have been in recent use are reduced to synonymy.

Introduction

This List is intended to provide the correct nomenclature and synonymy for the Orchidaceae of Western Australia as far as is possible at present. Essentially, it gives the results of checking the Type collections of all except seven of the names which have been applied to orchids occurring in the State. In the past, the family has been studied quite extensively here as elsewhere, but a major handicap has been the location of most early type specimens in European herbaria. Most Australian workers since 1880 have used only the available literature in their interpretations, and their conclusions in some groups such as *Diuris* and *Pterostylis* have varied considerably. Bentham, in the "Flora Australiensis", submerged many species, and this has been accepted largely without question, even though he worked only on herbarium material which was often in poor condition. It was therefore probable that on close examination by workers familiar with the orchids in Australia, a proportion of the species synonymised by Bentham would prove to be valid, and that many would prove to be conspecific with more recently-described species.

In 1968, as Botanical Liaison Officer at the Royal Botanic Gardens, Kew, I was able to examine the types of Western Australian (and some eastern States) orchids which are housed at Kew, at the British Museum (Natural History) or at various European herbaria. Other types housed in Australian herbaria have been borrowed for study or examined during visits to the various institutions. The types of almost all the names applied to Western Australian orchids have now been seen, and the relevant literature has been studied. As a result, 25 names which have been in recent use have been found to be synonymous with earlier names. Ten new combinations are made for taxa which are considered to require a change of status. One new generic name is proposed—*Leporella*, to replace *Leptoceras* R. Fitzg. non (R. Br.) Lindl.

The List includes every name which has been applied to Western Australian orchids in the literature, including mis-identifications. The date and place of original publication are given, followed by the type collections and where the latter are housed. These have been seen unless otherwise indicated. In a number of cases lectotypes have been chosen, and here consideration has been given to the original descriptions, annotations by authors, and current usage where the type material contains more than one taxon.

Synonyms are listed in the alphabetical sequence and again in chronological order under the relevant accepted names for the taxa, but details of type collections only in the latter situation. Where recently-accepted names are reduced to synonymy the conclusions have been based on a study of the type

collections, original descriptions and the range of material available. An explanation is given if the conclusion is not straightforward.

The number of epithets applied to Western Australian orchids is 233 of which 204 are of specific and 29 of infra-specific rank. There are another 49 combinations involving some of these epithets, including 10 made in this paper, so that the total number of names is 282. Of these 148 are here accepted, including 20 infra-specific taxa.

Some taxa are left without names as a result of this work, but their status is considered doubtful and further work on them is required. Examples are the orchids described in Pelloe (1930) and Erickson (1951, 1965) as *Drakaea elastica* and *Thelymitra aristata*.

The list also cites 15 taxa which have been recorded for Western Australia at various times but are now considered not to occur here. In some cases the records were based on wrong determinations, in others apparently only on assumptions. The reference to the original record is given, and the correct name for mis-identified specimens. Many of these records have been carried on in various works on orchids, e.g. Blackall (1954), Erickson (1951, 1965), Firth (1965), Gardner (1930), Nicholls (1969), Pelloe (1930), Rogers in Black (1943), Rupp (1943) and Willis (1962).

Lindley's Types

These are housed in a special collection at the Herbarium of the Royal Botanic Gardens, Kew. In "A Sketch of the vegetation of the Swan River Colony", where Lindley described most of his Western Australian species, very few types were cited. In the introduction he stated (p. 2) only that he had "an herbarium of about 1,000 species, formed by the communications of Mr. James Drummond, now resident in the Colony, Captain James Mangles, R.N., R. Mangles, Esq., Mr. Toward, Gardener to Her Royal Highness the Duchess of Gloucester, and N. B. Ward, Esq., of Wellesloe Square". Several collectors such as Mrs. Molloy of Augusta sent specimens to these people and sometimes they have been recorded in the Lindley collection under the recipient's name. The sheets have manuscript names in Lindley's hand; where there is a single collection it is taken as the holotype, but where there are two or more collections a lectotype has been chosen. The collections cited in Lindley's *Genera and Species of Orchidaceous Plants* have been considered and in most cases are those represented in his herbarium. There are often duplicates, especially of the Drummond collections, at other herbaria.

R. Fitzgerald's Types

It has long been thought that Fitzgerald destroyed all his specimens after drawing them. At the British Museum (Natural History) are a number of his specimens. They have small labels with his name printed on them, and the identifications and localities written in his own hand. The specimens are not always complete, and often are not those illustrated in "Australian Orchids", but they are apparently from the type collections. Fitzgerald cited no localities with the descriptions in the *Gardener's Chronicle* but usually gave them in "Australian Orchids". In most cases the British Museum specimens are from the same localities and are here selected as lectotypes. There are also a few Fitzgerald specimens in the National Herbarium of New South Wales but they do not have his writing. They are from the Deane Collection and are marked "R. D. Fitzgerald, W.A.". These are probably syntypes.

Guide to the List

Accepted names are printed in heavy type and synonyms in italics, except in the discussions where all names are in italics.

Apart from literature references, the following abbreviations are used:—

The = sign denotes synonymy.

Type categories: holo.—holotype.

iso.—isotype, isoelectotype.

lecto.—lectotype.

syn.—syntype.

Herbaria: these are the standard abbreviations as listed in the Index Herbariorum (1964). K-L is the Lindley Collection at the Herbarium of the Royal Botanic Gardens, Kew.

Acknowledgements

Valuable co-operation in providing facilities for study, assistance to locate type collections and the loan of specimens has been received from a number of institutions. I wish to express my thanks to the Directors and staff of the following institutions:—

State Herbarium of South Australia, Adelaide (AD); Botany School, University of Cambridge, England (CGE); Botany Division, D.S.I.R., Christchurch, New Zealand; Royal Botanic Garden, Edinburgh, Scotland (E); Herbarium Universitatis Florentinae, Instituto Botanico, Firenze, Italy (FI); Conservatoire et Jardin botaniques, Genève, Switzerland (G); Systematisch-Geobotanisches Institut, Universität Göttingen, W. Germany (GOET); Herbarium, Royal Botanic Gardens, Kew, England (K); Rijksherbarium, Leiden, Netherlands (L); British Museum (Natural History), London, England (BM); Botanical Museum, Lund, Sweden (LD); National Herbarium of Victoria, Royal Botanic Garden, Melbourne, Victoria (MEL); Muséum d'Histoire Naturelle, Laboratoire de Phanérogamic, Paris, France (P); National Herbarium of New South Wales, Sydney (NSW); Naturhistorisches Museum, Wien, Austria (W).

ACIANTHUS

Acianthus R. Br., Prod. 321 (1810). *Cyrtostylis* R. Br., Prod. 322 (1810).

A. exsertus R. Br., Prod. 321 (1810). Recorded for Western Australia by Rogers in Black, Fl. S. Austral. 132 (1922). There is no authentic record from W.A. Possibly a collection from Bayswater, Victoria caused the error, as there is also a Bayswater in W.A.

A. huegelii (Endl.) Nicholls et Goadby, Vict. Nat. 50:106 (1906)

= *Acianthus reniformis* (R. Br.) Schlechter var. *huegelii* (Endl.) A. S. George.

A. reniformis (R. Br.) Schlechter, Bot. Jahrb. 39:39 (1906).

var. *reniformis*

Cyrtostylis reniformis R. Br., Prod. 322 (1810)—*Caladenia reniformis* (R. Br.) Reichb. f., Beitr. Syst. Pfl. 67 (1871)—

Type: Port Jackson, R. Brown, May-June 1802—holo.: BM, iso.: G, FI.
var. *huegelii* (Endl.) comb. nov.

Basionym: *Cyrtostylis huegelii* Endl. in Lehm., Pl. Preiss, 2:6 (1846)—*Caladenia reniformis* (R. Br.) Reichb. f. var. *huegelii* (Endl.) Reichb. f., Beitr. Syst. Pfl. 67 (1871)—*Cyrtostylis reniformis* R. Br. var. *huegelii* (Endl.) Benth., Fl. Austral. 6:376 (1873)—*Acianthus huegelii* (Endl.) Nicholls et Goadby, Vict. Nat. 50:106 (1933)—

Type: Rottneest Island, Preiss 2204, Aug. 22, 1839—holo.: W, iso.: W, G, P.

This differs from the var. *reniformis* in having a narrower labellum—less than 3 mm as against 3–5 mm—which is also usually more acute. It is often greenish-brown, whereas the typical variety is more reddish-brown. Nicholls and Goadby erred in reducing their *A. tenuissimus* to a synonym

of this taxon, as it has much smaller flowers, the labellum is triangular and the flowering period is some two months later.

A. tenuissimus Nicholls et Goadby, Vict. Nat., 50:22 (1933)—

Type: Bayswater, near Perth, *Goadby*, Sept.-Oct. 1932—holo.:PERTH, iso.:PERTH.

CALADENIA

Caladenia R. Br., Prod. 323 (1810).

C. aphylla Benth., Fl. Austral. 6:387 (1873)—

Type: King George Sound, *Harvey*—lecto.:K; Forest Hill, *Muir*—iso.:K; Hay and Kalgan Rivers, *F. Mueller*—not seen; Three-miles Plain, *Maxwell*—not seen.

C. barbarossa Reichb. f., Beitr. Syst. Pfl. 64 (1871)—

Type: Swan River, *Drummond* 861—holo.:W, iso.:W, G, P. The original and correct spelling of the epithet is *barbarossa*, not *barbarossae* as used by subsequent workers.

C. bicolor R. S. Rogers, Trans. Roy. Soc. S. Austral. 54:46 (1930)

= **C. radialis** R. S. Rogers.

C. brunonis (Endl.) Reichb. f., Beitr. Syst. Pfl. 67 (1871)

Elythranthera brunonis (Endl.) A. S. George.

C. bryceana R. S. Rogers, Trans. Roy. Soc. S. Austral. 38:359 (1914)—

Type: Gnowangerup, *Miss Bryce MacLutye*, Sept. 3, 1914—holo.:AD.

C. caerulea R. Br., Prod. 324 (1810)—

Type: Port Jackson, *R. Brown* May, 1802; June, 1803; Sept. 1804—BM.

C. cairnsiana F. Muell., Fragm. 7:31 (1869)—

Type: North of Stirling Range, *Mueller*—holo.:MEL, iso.:K.

C. carnea R. Br., Prod. 324 (1810). Recorded for Western Australia by Rogers in Black, Fl. S. Austral. 140 (1922), possibly on the basis of Sargent's record (Journ. W. Austral. Nat. Hist. Soc. no. 3:12 (1906) of the var. *alba* (R. Br.) Benth. This was a misidentification of *Caladenia saccharata* Reichb. f.

C. clavigera A. Cunn. ex Lindl., Gen. et Sp. Orch. Pl. 422 (1840). Recorded for Western Australia by Rogers, Trans. Roy. Soc. S. Austral. 44:353 (1920), but later described as a new species, *C. radialis* Rogers (1927).

C. congesta R. Br., Prod. 324 (1810). Doubtfully recorded for Western Australia by Bentham (Fl. Austral. 6:387) but the collection, by Mangles, is probably *C. marginata* Lindl.

C. corynephora A. S. George, Nuytsia 1, 2:158 (1971)—

Type: Banks of Donnelly River, 15 miles W. of Pemberton, W.A., *A. S. George* s.n., Dec. 7, 1957—holo.:PERTH, iso.:K.

C. crebra A. S. George, Nuytsia 1, 2:160 (1971)—

Type: 24 miles S. of Dongara, W.A., in sandy soil with *Eucalyptus erythrocorys* and scrub, *A. S. George* 9621, Aug. 29, 1969—holo.:PERTH, iso.:K, MEL, NSW.

C. cristata R. S. Rogers, Trans. Roy. Soc. S. Austral. 47:337 (1923)—

Type: Milng, Murchison district, *E. Simpson*, Sept. 1923—holo.:AD, iso.:PERTH.

C. deformis R. Br., Prod. 324 (1810)—

Type: Port Dalrymple, Tas., *Paterson*—holo.:BM.

- C. unguiculata* Lindl., Sketch Veg. Swan Riv. Col. 51 (1840)—
Type: Swan River, *Drummond*.
- C. denticulata* Lindl., Sketch Veg. Swan Riv. Col. 52 (1840)
= *C. filamentosa* R. Br. var. *denticulata* (Lindl.) Reichb. f.
- C. dilatata* R. Br., Prod. 325 (1810).
var. *dilatata*—*Caladenia patersonii* R. Br. var. *dilatata* (R. Br.) Benth.,
Fl. Austral. 6:382 (1873)—
Type: Port Dalrymple, Tas., *Paterson*—holo.:BM.
var. *falcata* W. H. Nicholls, Vict. Nat. 65:268 (1949)—
Type: Kojonup, *Nicholls*, Sept. 26, 1948—holo.:MEL.
- C. dilatata* R. Br. var. *rhomboidiformis* E. Coleman, Vict. Nat. 46:197 (1930)
= *C. longiclavata* E. Coleman var. *rhomboidiformis* (E. Coleman) A. S. George.
- C. discoidea* Lindl., Sketch Veg. Swan Riv. Col. 52 (1810)—
Type: Swan River, *Drummond*—holo.:K-L, iso.:K, G.
- C. dorrienii* Domin, Journ. Linn. Soc. (Bot.) 41:251 (1912)
= *C. filamentosa* R. Br. var. *dorrienii* (Domin.) A. S. George.
- C. douthae* O. H. Sargent, Journ. Bot. 59:175 (1921)—
Type: Datatine, near Katanning, *Miss L. Douth*—holo.:PERTH.
- C. drummondii* Benth., Fl. Austral. 6:385 (1873)—
Type: Swan River, *Drummond*—holo.:K.
Caladenia glossodiphylla Rupp and Erickson, W. Austral. Nat. 4:65 (1953)—
Type: Wongan Hills, *Mrs. R. Erickson*, June 10, 1953—holo.:PERTH.
- C. elongata* Lindl., Sketch Veg. Swan Riv. Col. 52 (1840)
= *C. latifolia* R. Br.
- C. emarginata* (Lindl.) Reichb. f., Beitr. Syst. Pfl. 67 (1871)
= *Elythranthera emarginata* (Lindl.) A. S. George.
- C. ensata* W. H. Nicholls, Vict. Nat. 64:138 (1947)
= *C. longiclavata* E. Coleman var. *longiclavata*.
- C. ericksonae* W. H. Nicholls, Vict. Nat. 66:214 (1950)—
Type: Bolgart, *Mrs. R. Erickson*, Sept. 27, 1949—holo.:MEL.
- C. ferruginea* W. H. Nicholls, Vict. Nat. 64:136 (1947)
= *C. huegelii* Reichb. f.
- C. filamentosa* R. Br., Prod. 324 (1810).
var. *filamentosa*
Type: Port Dalrymple, Tas., *Paterson*—holo.:BM. No material from Western Australia quite matches the typical form from eastern Australia.
var. *caesarea* Domin, Journ. Linn. Soc. (Bot.) 41:251 (1912)—
Type: Bridgetown to Kojonup and Slab Hut Gully, *Dorrien-Smith*, 1909—holo.:K, iso.:L.
var. *denticulata* (Lindl.) Reichb. f., Beitr. Syst. Pfl. 66 (1871)—*Caladenia denticulata* Lindl., Sketch Veg. Swan Riv. Col. 52 (1840)—
Type: Swan River, *Drummond*—holo.:K-L, iso.:K, G.—
C. filamentosa R. Br. var. *pallens* Benth., Fl. Austral. 6:381 (1873)—
Types: Swan River, *Drummond* 442—lecto.:K, iso.:G; Swan River, *Mylne*—Syn.:K.
var. *dorrienii* (Domin) comb. et stat. nov.—*Caladenia dorrienii* Domin, Journ. Linn. Soc. (Bot.) 41:25 (1912)—

- Type*: Bridgetown to Kojonup and Slab Hut Gally, *Dorrien-Smith*, 1909—holo.:K.
- This variety has the basic morphology of the *filamentosa* complex. It is really a reduction in size from the var. *denticulata*.
- var. *filifera* (Lindl.) Reichb. f., Beitr. Syst. Pfl. 66 (1871)—*C. filifera* Lindl., Sketch Veg. Swan Riv. Col. 52 (1840)—
Type: Swan River *Drummond*—holo.:K-L, iso.:K, G.
- var. *pallens* Benth., Fl. Austral. 6:381 (1873)
 = *C. filamentosa* R. Br. var. *denticulata* (Lindl.) Reichb. f.
- var. *tentaculata* Rogers in Black, Fl. S. Austral. 1:138 (1922)—
Type: Caroon Hill, 45 miles W of Port Augusta, *W. L. Cleland*, Aug. 1889—holo.:AD. The taxon is based on *Caladenia tentaculata* Tate, nom. illeg. and is therefore regarded as a new epithet.
- C. filifera* Lindl., Sketch Veg. Swan Riv. Col. 52 (1840)
 = *C. filamentosa* R. Br. var. *filifera* (Lindl.) Reichb. f.
- C. fimbriata* (Lindl.) Reichb. f., Beitr. Syst. Pfl. 65 (1871)
 = *Leporella fimbriata* (Lindl.) A. S. George.
- C. fimbriata* (Lindl.) Reichb. f. var. *pectinata* (Lindl.) Reichb. f., Beitr. Syst. Pfl. 65 (1871)
 = *Leporella fimbriata* (Lindl.) A. S. George.
- C. flava* R. Br., Prod. 324 (1810)—
Type: King George Sound, *Menzies*, 1791—holo.:BM, iso.:E.
- C. gemmata* Lindl., Sketch Veg. Swan Riv. Col. 52 (1840).
 forma *gemma*—
Type: Swan River. *Drummond*—lecto.:K-L, iso.:K, G; *Vasse*, *Mrs. Molloy*—syn.:K-L, Swan River, *Mangles*—syn.:K-L.—
C. pellita Endl. in Lehm., Pl. Preiss 2:8 (1846)—
Type: Near Perth, *Preiss* 2192, Sept. 23, 1839—lecto.:W, iso.:W, G.—
C. gertrudae Ostenf., Dansk. Vidensk. Selsk. Biol. Medd. 3, 2:43 (1921)—
Type: Yallingup Cave, *Ostenfeld*, Sept. 26, 1914—iso.:K.
 forma *lutea* S. C. Clemesha, Orchad. 2, 9:118 (1967)—
 based on *Caladenia ixiooides* Lindl., Sketch Veg. Swan Riv. Col. 52 (1840)—
C. gemmata Lindl. var. *ixiooides* (Lindl.) Ewart et White, Proc. Roy. Soc. Vict. 22 (n.s.):317 (1910)—
Type: Swan River, *Drummond*—holo.:K-L, iso.:K, G.
- C. gemmata* Lindl. var. *ixiooides* (Lindl.) Ewart et White, Proc. Roy. Soc. Vict. 22 (n.s.):317 (1910)
 = *C. gemmata* Lindl. forma *lutea* Clemesha.
- C. gertrudae* Ostenf., Dansk. Vidensk. Selsk. Biol. Medd. 3, 2:43 (1921)
 = *C. gemmata* Lindl. forma *gemma*.
- C. glossodiphylla* Rupp and Erickson, W. Austral. Nat. 4:65 (1953)
 = *C. drummondii* Benth.
- C. graminifolia* A. S. George, Nuytsia 1,2:162 (1971)—
Type: Culham Inlet, W. of Hopetoun, W.A., in sandy soil under *Eucalyptus platypus* var. *heterophylla*, A. S. George 9468, Aug. 1, 1969—holo.:PERTH, iso.:K, MEL, NSW.
- C. hirta* Lindl., Sketch Veg. Swan Riv. Col. 52 (1840)—
Types: *Vasse River*, *Mrs. Molloy*—lecto.:K-L; Swan River, *Drummond*—syn.:K-L, Fl.—

Caladenia tenuis R. Fitzg., Gard. Chron. 17, 1 (n.s.):461 (1882)—

Type: Fitzgerald designated no Type; a collection at BM with this name is labelled "St. Werberg, W.A. Sept." in Fitzgerald's hand, and is here selected as Lectotype. An unpublished plate by Fitzgerald in the Mitchell Library, Sydney, has the locality "Champion Bay 4 Aug".

C. huegelii Reichb. f., Beitr. Syst. Pfl. 66 (1871)—

Types: Swan River, *Huegel*—lecto.:W, iso.:W; Swan River, *Drummond* 439—syn.:FI, G, K: *Drummond* 832—syn.:not seen.—

Caladenia pectinata R. S. Rogers, Trans. Roy. Soc. S. Austral. 47:341 (1920)—

Types: Albany, *Rogers*, Sept., 1919—lecto.:AD; York, *O. H. Sargent*—syn.:not seen: Cork Swamp near Perth, *Tapp*, Sept. 3, 1907—syn.:AD; Swan View, *Cooke*, Sept. 13, 1906—syn.:AD.—

C. ferruginea W. H. Nicholls, Vict. Nat. 64:136 (1947)—

Types: Armadale, *Nicholls*, Sept., 1946—lecto.:MEL, iso.:PERTH; Waterloo, *Nicholls*, Oct., 1946—syn.:MEL; between Yarloop and Cookernup, *Nicholls*, Oct., 1946—syn.: not seen.

C. huegelii was described in the middle of a paragraph and was not listed in Index Kewensis, so the name has been overlooked by later workers. The specimen chosen as Lectotype is that which best agrees with Reichenbach's description: there are two others on the Huegel sheet, one of which is *C. longiclavata* E. Coleman var. *longiclavata*.

The collections chosen as Lectotypes of *C. pectinata* and *C. ferruginea* were both marked "Type" by the respective authors. Although *C. huegelii* is a variable species, the types of *C. pectinata* and *C. ferruginea* agree quite well with the Huegel collection.

C. integra E. Coleman, Vict. Nat. 49:246 (1933)—

Types: Tunney, *Miss R. Sandilands*, Sept., 1930, 1931; Kendenup, *Rowe*, Sept., 1931, 1932—MEL. There is one sheet with all these details on the label, containing one flowering stem, a leaf and two dissected specimens, one having only the column and labellum. Mrs. R. Erickson (nee Sandilands) examined the sheet in 1969 and stated that the mounted flowering stem (without the leaf) was her original collection of 1930.

This specimen is selected as Lectotype.

C. ixioides Lindl., Sketch Veg. Swan Riv. Col. 52 (1840)—

= *C. gemmata* Lindl. forma *lutea* S. C. Clemesha.

C. latifolia R. Br., Prod. 324 (1810)—

Type: Port Dalrymple, Tas., *Paterson*—holo.:BM, iso.:E.—

C. elongata Lindl., Sketch Veg. Swan Riv. Col. 52 (1840)—

Type: Swan River, *Drummond*—holo.:K-L, iso.:K—

C. mollis Lindl., Sketch Veg. Swan Riv. Col. 51 (1840)—

Type: Swan River, *Drummond*—holo.:K-L, iso.:K.

C. latifolia R. Br. var. *angustifolia* Benth., Fl. Austral. 6:385 (1873)

= *C. marginata* Lindl.

C. latifolia R. Br. var. *glandula* Ewart et Wood, Proc. Roy. Soc. Vict. 23 (n.s.): 290 (1911)

= *C. marginata* Lindl.

C. lavandulacea R. S. Rogers, Trans. Roy. Soc. S. Austral. 51:11 (1927)

Type: Between York and Narrogin, *Miss W. Dedman*, late Sept., 1926—holo.:AD.

C. lobata R. Fitzg., Gard. Chron. 17 (n.s.):461 (1882)—

Type: Western Australia, *Fitzgerald*. In Australian Orchids 3, 1 (1882), Fitzgerald gives the locality "St. Werberg's, on the Upper Hay River". There is one sheet at BM labelled "St. Werberg, Sept." in Fitzgerald's hand, and this can be taken as the type. At NSW there is a sheet from the Deane Collection labelled "R. D. Fitzgerald, W.A.", which is probably an isotype.

C. longicauda Lindl., Sketch Veg. Swan Riv. Col. 52 (1840)

C. patersonii R. Br. var. **longicauda** (Lindl.) R. S. Rogers.

C. longicauda Lindl. var. *eminens* Domin, Journ. Linn. Soc. (Bot.)41:253 (1912)

C. patersonii R. Br. var. **longicauda** (Lindl.) Rogers.

C. longicauda Lindl. forma *elatio*r Endl. in Lehm., Pl. Preiss 2:9 (1846)—nomen nudum.

C. longicauda Lindl. forma *humilior* Endl. in Lehm., Pl. Preiss. 2:9 (1846)—nomen nudum.

C. longiclavata E. Coleman, Vict. Nat. 46:196 (1930).

var. **longiclavata**

Type: In the protologue, Coleman cites Busselton, Capel, Donnybrook, Augusta, Forest Grove and Boyup Brook, Sept., Oct., 1928, 1929, and states that "The type is in the Melbourne Herbarium". There is one sheet with four specimens at MEL—1002450, ex. Herb. Coleman—"South-west. Miss Corker, Mr. Hill, Mr. Mitchell, Rev. E. Bryant. Sept., Oct., 1928, 1929." There is some variation in the specimens; in fact, one complete specimen which may be that illustrated by Coleman, agrees well with *Caladenia magniclavata* Nicholls. As all agree with Coleman's description, the other complete specimen is selected as Lectotype in order to maintain current usage. A sheet at PERTH, Boyup Brook, Miss E. Corker, Sept., 1928, which agrees with the Lectotype, is taken to be a syntype.—

C. ensata W. H. Nicholls, Vict. Nat. 64:138 (1947)—

Type: King River, near Ballymena Guest House, and on granite slope 1½ miles west, *Nicholls*, Oct., 1946—holo.:MEL, iso.:PERTH.

var. **magniclavata** (W. H. Nicholls) comb. ct stat. nov.

Basionym: *Caladenia magniclavata* W. H. Nicholls, Vict. Nat. 64:135 (1947)—

Type: Lesmurdie, Darling Range, *Nicholls*, Sept. 14, 1946.—holo.:MEL. This form is not sufficiently distinct from typical *C. longiclavata* to warrant specific rank. It is a more robust plant, with slightly different calli (more slender, apices more recurved,) and a smooth (not scabrous) labellum fringe.

var. **rhomboidiformis** (E. Coleman) comb. nov.

Basionym: *Caladenia dilatata* R. Br. var. *rhomboidiformis* E. Coleman, Vict. Nat. 46:197 (1930)—

Type: Coleman cites "Busselton, Capel, Forest Grove, Augusta, Boyup Brook, Mundaring, Waterloo, Sept., Oct., 1928, 1929. For specimens, Sept. and Oct., 1928, I am indebted to Miss Edna Corker, Mr. C. Hill, Mr. S. Mitchell and Rev. E. Bryant . . . Specimens . . . are in the Melbourne Herbarium". A sheet at MEL—1002422—bears three mounted and two dissected specimens, with the details more or less as above. It is now impossible to assign the specimens to individual collections. As there is some slight variation in morphology, one of the mounted specimens is selected as Lectotype. The taxon is very similar to *C. longiclavata* var. *longiclavata* differing essentially in the acuminate, not clubbed, petals.

C. macrophylla R. Br. Prod. 325 (1810)

= *C. menziesii* R. Br.

C. macrostylis R. Fitzg., Gard. Chron. 17:462 (1882)—

Type: Western Australia, *Fitzgerald*. In *Australian Orchids* 2, 1 (1882), Fitzgerald cites "St. Werberg, Upper Hay River". There is a sheet at BM labelled "St. Werberg, Sept." in Fitzgerald's hand, which may be taken as the type.

C. magniclavata W. H. Nicholls, Vict. Nat. 44:135 (1947)—

= *C. longiclavata* Coleman var. *magniclavata* (Nicholls) A. S. George.

C. marginata Lindl., Sketch Veg. Swan Riv. Col. 51 (1840)—

Type: King George Sound, *A. Collie*—holo.:K-L, iso.:K.—

C. ochreatea Lindl., Sketch Veg. Swan Riv. Col. 51 (1840)—

C. marginata Lindl. var. *ochreatea* (Lindl.) Reichb. f., Beitr. Syst. Pfl. 64 (1871)—

Type: Swan River, *Drummond*—holo.:K-L, iso.:K, G.—

C. latifolia R. Br. var. *angustifolia* Benth., Fl. Austral. 6:385 (1873)—

Types: Lake Muir, *Muir*—lecto.:K; Upper Hay River, *Miss Warburton*—not seen. The Muir sheet bears two specimens of *C. marginata* and four of *C. reptans* Lindl. As the former has much longer, narrower leaves, it is probably the form described by Bentham.—

C. paniculata R. Fitzg., Gard. Chron. 17:461 (1882)—

Type: Western Australia, *Fitzgerald*. In *Australian Orchids* 2, 1 (1882), Fitzgerald cites "St. Werberg, Upper Hay River... September". There is a sheet at BM, labelled "St. Werberg, Sept." in Fitzgerald's hand, which may be taken as the type.—

C. purdieana C. Andrews, Journ. Muell. Bot. Soc. W. Austral. no. 10:39 (1902)—

Type: Kelmscott, *Andrews*, Oct. 1902—holo.:PERTH, iso.:K.—

C. latifolia R. Br. var. *glandula* Ewart et Wood, Proc. Roy. Soc. Vict. 23 (n.s.):290 (1911)—

Type: Lowden, Preston River, *Koch* 1944, Nov.-Dec. 1909— iso.:K, E, P.

Examination of the descriptions and types of all these names has shown them to be conspecific. Different interpretations of the calli has caused some of the confusion (George, W. Austral. Nat. 8, 2:40 (1961). *C. marginata* and *C. ochreatea* are of the same date but as Reichenbach f. reduced *ochreatea* to a variety of *marginata* the latter name is maintained.

C. marginata Lindl. var. *ochreatea* (Lindl.) Reichb. f., Beitr. Syst. Pfl. 64 (1871)
= *C. marginata* Lindl.

C. menziesii R. Br., Prod. 325 (1810)—*Leptoceras menziesii* (R. Br.) Lindl., Gen. et Sp. Orch. Pl. 416 (1840)—

Type: King George Sound, *Menzies*, 1791—holo.:BM.—

Caladenia macrophylla R. Br., Prod. 325 (1810)—*Leptoceras macrophylla* (R. Br.) Lindl., Gen. et Sp. Orch. Pl. 416 (1840)—

Type: King George Sound, *Menzies*, 1791—holo.:BM.—

Leptoceras oblonga Lindl., Sketch Veg. Swan Riv. Col. 53 (1840)—

Type: Swan River, *J. Mangles*—holo.:K-L.

C. mollis Lindl., Sketch Veg. Swan Riv. Col. 51 (1840)

= *C. latifolia* R. Br.

C. multiclavia Reichb. f., Beitr. Syst. Pfl. 64 (1871)—

Types: Swan River, *Drummond* 5. 441—lecto.:W, iso.:CGE, FI, G, K, K-L; *Drummond* 440—no specimen of this collection seen. A sheet at FI labelled *Drummond* 440 is *Caladenia lobata* R. Fitzg.

C. multiclavia Reichb. f. var. *brevicuspis* Benth., Fl. Austral. 6:380 (1873)—

Type: Western Australia, *Drummond*. No specimen of this has been found, and the application of the name remains doubtful.

C. nana Endl. in Lehm., Pl. Preiss. 2:7 (1846)—

Type: Mt. Clarence, *Preiss* 2205, Oct. 5, 1840—holo.:W, iso.:W, G.—

C. unita R. Fitzg., Gard. Chron. 17:461 (1882)—

Type: Western Australia, *Fitzgerald*. No locality was cited in Austral. Orch. 2, 5, but there is a sheet at BM, labelled “Wilson’s Inlet” in *Fitzgerald*’s hand, here selected as lectotype.

This species varies in size from 3-4 cm. tall to about 25 cm. *Preiss*’s specimens are small, while *Fitzgerald* figured tall plants, but the morphology is similar.

C. nigricans (R. Br.) Reichb. f., Beitr. Syst. Pfl. 67 (1871)

= *Lyperanthus nigricans* R. Br.

C. ochreata Lindl., Sketch Veg. Swan Riv. Col. 51 (1840)

= *C. marginata* Lindl.

C. paniculata R. Fitzg., Gard. Chron. 17 (n.s.):461 (1882)

= *C. marginata* Lindl.

C. patersonii R. Br., Prod. 324 (1810).

var. *patersonii*

Type: Port Dalrymple, Tas., *Paterson*, Nov., 1804—holo.:BM. The typical variety has not been recorded for Western Australia.

var. *dilatata* (R. Br.) Benth., Fl. Austral. 6:382 (1873)

= *C. dilatata* R. Br.

var. *longicauda* (Lindl.) R. S. Rogers, Trans. Roy. Soc. S. Austral. 44:351 (1920)—*Caladenia longicauda* Lindl., Sketch Veg. Swan Riv. Col. 52 (1840)—

Types: Swan River, *Drummond*—lecto.:K-L, iso.:K-L, W, G, FI. One of the two specimens on the lectotype sheet matches *Lindley*’s illustrations in Sketch Veg. Swan Riv. Col. t.8. The sheet also has two specimens of *C. longiclavata* E. Coleman var. *longiclavata*.—

C. longicauda Lindl. var. *eminens* Domin, Journ. Linn. Soc. (Bot.) 41:253 (1912)—

Type: Mallet, *Dorrien-Smith*—holo.:K.

C. pectinata R. S. Rogers, Trans. Roy. Soc. S. Austral. 47:341 (1920)

= *C. huegelii* Reichb. f.

C. pellita Endl. in Lehm., Pl. Preiss 2:8 (1846)

= *C. gemmata* Lindl. forma *gemma*.

C. plicata R. Fitzg., Gard. Chron. 17:461 (1882)—

Type: Western Australia, *Fitzgerald*. In Australian Orchids 2, 1 (1882) *Fitzgerald* cites “near Albany, King George’s Sound and at St. Werberg’s, Upper Hay River.” There is a sheet at BM, labelled “St. Werberg Sept.” in *Fitzgerald*’s hand, which is here designated as lectotype. At NSW there is a specimen from the Deane Collection, labelled “R. D. Fitzgerald, W.A.” which is probably a syntype.

- C. preissii* Endl. in Lehm., Pl. Preiss. 2:7 (1846)
= *C. reptans* Lindl.
- C. purdieana* C. Andrews, Journ. Muell. Bot. Soc. W. Austral. no. 10:39 (1902)
= *C. marginata* Lindl.
- C. radialis* R. S. Rogers, Trans. Roy. Soc. S. Austral. 51:296 (1927)—
Types: Dowerin, *E. H. Ising*, Sept. 1, 1926—lecto.:AD; Beverley, *F. Stoward*, Sept. 13, 1913—not seen.—
C. bicolor R. S. Rogers, Trans. Roy. Soc. S. Austral. 54:46 (1930)—
Type: Swan View, *Mrs. W. Cooke*, Sept. 13, 1907—holo.:AD. The locality is probably an error, as this is a plant of drier districts and is otherwise unknown within 50 miles of Swan View.
The only notable difference between the original descriptions of *C. radialis* and *C. bicolor* is the absence of glands at the base of the column in *radialis* and their presence in *bicolor*. This is a variable character, insufficient to maintain the two species separately. The type of *radialis* does in fact have two small glands on the column. The margins of the labellum may be shortly dentate or entire, and the calli vary in number and robustness.
- C. radiata* W. H. Nicholls, Vict. Nat. 65:267 (1949)—
Type: Yarloop, *Nicholls*, Oct. 9, 1948—holo.:PERTH.
- C. reniformis* (R. Br.) Reichb. f., Beitr. Syst. Pfl. 67 (1871)—
Cyrtostylis reniformis R. Br.
= *Acianthus reniformis* (R. Br.) Schlechter var. *reniformis*.
- C. reniformis* (R. Br.) Reichb. f. var. *huegelii* (Endl.) Reichb. f., Beitr. Syst. Pfl. 67 (1871)—
Cyrtostylis huegelii Endl.
= *Acianthus reniformis* (R. Br.) Schlechter var. *huegelii* (Endl.) A. S. George.
- C. reptans* Lindl., Sketch Veg. Swan Riv. Col. 52 (1840)—
Type: Swan River, *Drummond*—holo.:K-L, iso.:K, G, Fl.—
C. preissii Endl. in Lehm., Pl. Preiss. 2:7 (1846)—
Type: Preston Creek, Perth, *Preiss* 2208, July 25, 1839—iso.:W.
- C. reticulata* R. Fitzg., Gard. Chron. 17:462 (1882). Recorded for Western Australia by Sargent, Journ. W. Austral. Nat. Hist. Soc. no. 6:65 (1909), but this specimen should probably be referred to *C. longiclavata* E. Coleman.
- C. roei* Benth., Fl. Austral. 6:383 (1873)—
Type: Western Australia, *Roe*—holo.:K.
- C. saccharata* Reichb. f., Beitr. Syst. Pfl. 63 (1871)—
Type: Swan River, *Drummond* 324—holo.:W, iso.:CGE, P.
- C. sericea* Lindl., Sketch Veg. Swan Riv. Col. 52 (1840)—
Type: Swan River, *Drummond*—holo.:K-L.
- C. serrata* (Lindl.) Reichb. f., Beitr. Syst. Pfl. 67 (1871)—
= *Lyperanthus serratus* Lindl.
- C. sigmoidea* R. S. Rogers, Trans. Roy. Soc. S. Austral. 62:12 (1938)—
Type: Kumarl, *Horbury*, Aug. 25, 1937—holo.:AD, iso.:PERTH.
- C. tentaculata* Tate, Trans. Roy. Soc. S. Austral. 12:130 (1889)
= *C. filamentosa* R. Br. var. *tentaculata* Rogers.
- C. tenuis* R. Fitzg., Gard. Chron. 17:461 (1882)
= *C. hirta* Lindl.

C. triangularis R. S. Rogers, Trans. Roy. Soc. S. Austral. 51:10 (1927)—
Type: Highbury, Goadby, Sept., 1924—holo.:AD.

C. unguiculata Lindl., Sketch Veg. Swan Riv. Col. 51 (1840)
= *C. deformis* R. Br.

C. unita R. Fitzg., Gard. Chron. 17:461 (1882)
- *C. nana* Endl.

CALEANA

Caleana R. Br., Prod. 329 (1810).

C. nigrita Lindl., Sketch Veg. Swan Riv. Col. 54 (1840)—
Type: Swan River, Drummond—holo.:K-L, iso.:K.

CALOCHILUS

Calochilus R. Br., Prod. 320 (1810).

C. robertsonii Benth., Fl. Austral. 6:315 (1873)—

Types: Heaths near the Glenelg R., Vic., *Robertson*—lecto.: K; Bendigo, Oldfield—syn.:K; Mt. Melvor, *Mueller*—not seen.

CORYBAS

Corybas Salisb., Parad. Lond. t.83 (1805)—*Corysanthes* R. Br. Prod. 328 (1810).

C. dilatatus (Rupp et Nicholls) Rupp et Nicholls ex Rupp, Vict. Nat. 59:61 (1942)—*Corysanthes dilatata* Rupp et Nicholls, Proc. Linn. Soc. N.S.W. 53:87 (1928)—

Types: 14 localities were cited but no type designated. Study of all these collections is needed before a lectotype can be chosen.

C. fimbriatus (R. Br.) Reichb. f., Beitr. Syst. Pfl. 42 (1871). Recorded for Western Australia by Benth (Fl. Austral. 6:351) as *Corysanthes*. Western Australian specimens are now placed under *Corybas dilatatus*.

C. pruinosus (R. Br.) Reichb. f., Beitr. Syst. Pfl. 42 (1871). Recorded for Western Australia by Pescott (Orch. of Vict. 46 (1928)), as *Corysanthes*. Western Australian specimens are now placed under *Corybas dilatatus*.

C. unguiculatus (R. Br.) Reichb. f. Beitr. Syst. Pfl. 43 (1871)—
Corysanthes unguiculata R. Br. Prod. 328 (1810)—

Type: Port Jackson, NSW, *Bauer*—not seen.

CORYSANTHES

Corysanthes R. Br., Prod. 328 (1810)

- *Corybas* Salisb.

C. dilatata Rupp et Nicholls, Proc. Linn. Soc. N.S.W. 53:87 (1928)
= *Corybas dilatatus* (Rupp et Nicholls) Rupp et Nicholls ex Rupp.

C. unguiculata R. Br., Prod. 328 (1810)
= *Corybas unguiculatus* (R. Br.) Reichb. f.

CRYPTOSTYLIS

Cryptostylis R. Br., Prod. 317 (1810).

C. ovata R. Br. Prod. 317 (1810)—

Type: King George Sound, R. Brown, Dec., 1801—lecto.:BM; iso.:BM, E.

CYMBIDIUM

Cymbidium Swartz, Nov. Act. Soc. Sc. Upsal. 6:70 (1799).

C. canaliculatum R. Br., Prod. 331 (1810)—

Type: Broad Sound, Qld., *R. Brown*, Sept. 25, 1802—holo.:BM.

CYRTOSTYLIS

Cyrtostylis R. Br., Prod. 322 (1810)

= *Acianthus* R. Br.

C. huegelii Endl. in Lehm., Pl. Preiss. 2:6 (1846)

= *Acianthus reniformis* (R. Br.) Schlechter var. *huegelii* (Endl.) A. S. George.

C. reniformis R. Br., Prod. 322 (1810)

= *Acianthus reniformis* (R. Br.) Schlechter var. *reniformis*.

C. reniformis R. Br., var. *huegelii* (Endl.) Benth. Fl. Austral. 6:376 (1873)

= *Acianthus reniformis* (R. Br.) Schlechter var. *huegelii* (Endl.) A. S. George.

DENDROBIUM

Dendrobium Swartz, Nov. Act. Soc. Sc. Upsal. 6:82 (1799).

D. dicuphum F. Muell., Fragm. 8:28 (1873)—

Type: Liverpool River, N.T., *B. Gulliver*—iso.:K.

DIPODIUM

Dipodium R. Br., Prod. 330 (1810).

Dipodium venosum F. Muell., Fragm. 1:61 (1858)

= *Eulophia venosa* (F. Muell.) Reichb. f. ex Benth.

DIURIS

Diuris J. E. Smith, Trans. Linn. Soc. 4:222 (1798).

D. carinata Lindl., Gen. et Sp. Orch. Pl. 510 (Sept., 1840)

= *D. laxiflora* Lindl.

D. corymbosa Lindl., Sketch Veg. Swan Riv. Col. 51 (1840)

= *D. longifolia* R. Br.

D. drummondii Lindl., Sketch Veg. Swan Riv. Col. 51 (1840)

= *D. emarginata* R. Br. var. *emarginata*.

D. emarginata R. Br. Prod. 316 (1810).

var. *emarginata*

D. setacea R. Br. var. *emarginata* (R. Br.) Domin, Journ. Linn. Soc. (Bot.) 41:248 (1912)—

Type: King George Sound, *R. Brown*, Dec., 1801—holo.:BM, iso.:BM.

D. drummondii Lindl., Sketch Veg. Swan Riv. Col. 51 (1840)—

Types: Swan River, *Drummond*—lecto.:K-L, syn.:K, G; Swan River, *Mangles*—syn.:K-L.

var. *pauciflora* (R. Br.) comb. et stat nov.

Basionym: *Diuris pauciflora* R. Br., Prod. 316 (1810)—

Type: King George Sound, *R. Brown*, Dec., 1801—holo.:BM iso.:E, K.

This is a small-flowered form of *D. emarginata* which varies greatly in size.

D. filifolia Lindl., Sketch Veg. Swan Riv. Col. 51 (1840)

= *D. setacea* R. Br.

D. laevis R. Fitzg., Gard. Chron. 17:495 (1882)—

Type: Western Australia. In Australian Orchids, 2 3, Fitzgerald cites Albany. There is one sheet at BM, labelled "Wilson's Inlet, Sept." in Fitzgerald's hand, which may be taken as the lectotype. The original spelling was *laertis* which was altered without explanation to *laevis* in Australian Orchids. As the former has no apparent meaning it seems best to regard it as a typographical error and maintain *laevis*, which has been used by all subsequent workers.

D. laxiflora Lindl., Sketch Veg. Swan Riv. Col. 51 (Jan. 1840)—

Type: Swan River, *Drummond*—holo.:K-L.—

D. carinata Lindl., Gen. et Sp. Orch. Pl. 510 (Sept. 1840)—

Types: Swan River, *Drummond*—lecto.:K-L; Swan River, *Mangles*—syn.:K-L; Molloy Plains, *Vasse*, *Mrs. Molloy*—syn.:K-L.

It is unfortunate that the name *laxiflora* antedates *carinata*, as the latter has been in general use, while *laxiflora* was incorrectly placed under *D. emarginata* R. Br. by Bentham and has been overlooked until now. The holotype of *laxiflora* has no leaves and the flowers are on extremely long pedicels, but they agree morphologically with *carinata*.

D. longifolia R. Br., Prod. 316 (1810)—

Type: West Coast of New Holland, *Menzies*, 1791—lecto.:BM, iso.:BM.—

D. corymbosa Lindl., Sketch Veg. Swan Riv. Col. 51 (1840)—

D. longifolia R. Br. var. *corymbosa* (Lindl.) Domin. Journ. Linn. Soc. (Bot.) 41:249 (1912)—

Types: Swan River, *Drummond*—lecto.:K-L, syn.:K; King George Sound, *Collie*—syn.:K-L; Swan River, *Mangles*—syn.:K-L; *Vasse* River, *Mrs. Molloy*—syn.:K-L.—

D. porrifolia Lindl., Sketch Veg. Swan Riv. Col. 51 (1840)—

Type: Swan River, *Drummond*—holo.:K-L.—

D. longifolia R. Br. var. *parviflora* W. H. Nicholls, Vict. Nat. 64:115 (1947)—

Type: Lesmurdie, *Nicholls*, Sept., 1946—iso.:PERTH.

These names all refer to the small-flowered form of *Diuris longifolia*, although Domin incorrectly applied Lindley's epithet *corymbosa* to the large-flowered form. The Molloy collection on the Lindley sheet of *corymbosa* is in fact the large form, but the two specimens have four and five flowers, whereas Lindley's description states "scapo trifloro", which fits the lectotype. The Molloy specimens also lack leaves, which are present in the lectotype and were described by Lindley. Further work is required on the range of variation within *D. longifolia* before infraspecific names can be applied.

D. longifolia R. Br. *corymbosa* (Lindl.) Domin. Journ. Linn. Soc. (Bot.) 41:249 (1912)

= *D. longifolia* R. Br.

D. longifolia R. Br. var. *parviflora* W. H. Nicholls, Vict. Nat. 64:115 (1947)

= *D. longifolia* R. Br.

D. pauciflora R. Br., Prod. 316 (1810)

= *D. emarginata* R. Br. var. *pauciflora* (R. Br.) A. S. George.

D. pedunculata R. Br., Prod. 316 (1810). Recorded by A. Purdie, Journ. & Proc. Muell. Bot. Soc. W. Austral. 1, 7:17 (1900). This plant was later described by Diels as a new species, *D. purdiei*.

D. porrifolia Lindl., Sketch Veg. Swan Riv. Col. 51 (1840)

= *D. longifolia* R. Br.

D. purdiei Diels, Journ. Muell. Bot. Soc. W. Austral. no.11:79 (1903)—
Type: Cannington, *A. Purdie*, Oct. 7—iso.:BM, PERTH.

D. setacea R. Br. Prod. 316 (1810)—

Type: King George Sound, *R. Brown*, Dec., 1801—lecto.:BM, iso.:BM.

D. filifolia Lindl., Sketch Veg. Swan Riv. Col. 51 (1840)—

Types: Swan River, *Drummond*—lecto.:K-L, iso.:K; Swan River,
Mangles—syn.:K-L.

The correct identity of this species has been confused by the different interpretations of workers over the past 60 years. Examination of the types shows that *D. filifolia* is synonymous with *D. setacea*. As in the case of *Prasophyllum gibbosum*, Brown must have collected late-flowering specimens, as the species generally flowers in October.

D. setacea R. Br. var. *emarginata* (R. Br.) Domin. Journ. Linn. Soc. Bot. 41:248 (1912)

= *D. emarginata* R. Br. var. *emarginata*.

DRAKAEA

Drakaea Lindl., Sketch Veg. Swan Riv. Col. 55 (1840).

D. ciliata (Lindl.) Reichb. f., Beitr. Syst. Pfl. 68 (1871)

= *Spiculaea ciliata* Lindl.

D. elastica Lindl., Sketch Veg. Swan Riv. Col. 56 (1840)—

Type: Swan River, *Drummond*—holo.:K-L, iso.:K, FI.—

D. fitzgeraldii, Schlechter, Fedde Rep. Sp. Nov. 17:81 (1921)—

Type: This was based on Fitzgerald's illustration of *Drakaea elastica* in Australian Orchids 2, 1. The plate is here designated as the type, as no specimen of Fitzgerald's has been found. Schlechter was in error in thinking that the type of *D. elastica* had no spots on the labellum. Fitzgerald's plate is correctly named, and is a good representation of the species.

D. fitzgeraldii Schltr., Fedde. Rep. Sp. Nov. 17:81 (1921)

= *D. elastica* Lindl.

D. glyptodon R. Fitzg., Gard. Chron. 1:494 (1882)—

Type: s Western Australia. In Australian Orchids 2, 1, Fitzgerald cites Dardanup and Albany. At BM there is a sheet labelled "Bunbury, Sept.", in Fitzgerald's hand. This locality is close to Dardanup and is probably one of the original specimens. It is here selected as lectotype. There is one sheet at NSW with the locality of "W.A. RDF" which is probably a syntype.

D. jeanensis R. S. Rogers, Trans. Roy. Soc. S. Austral. 44:322 (1920)—

Type: Ravenswood, near Pinjarra, *J. S. Rogers*, Sept. 1, 1919—holo.:AD.

ELYTHRANTHERA

Elythranthera (Endl.) A. S. George, W. Austral. Nat. 9:6 (1963).

Glossodia R. Br. Sect. *Elythranthera* Endl., Nov. Stirp. Dec. 2:16 (1839). There seems no reason to take up the spelling *Elytranthera*, used without explanation by Endlicher in his Gen. Pl. Suppl. 1:1367 (1841).

E. brunonis (Endl.) A. S. George, W. Austral. Nat. 9:7 (1963)

Glossodia brunonis Endl., Nov. Stirp. Dec. 2:16 (1839)—*Caladenia brunonis* (Endl.) Reichb. f., Beitr. Syst. Pfl. 67 (1871)—

Type: Swan River Colony, South-west New Holland, Huegel. At W, there is one sheet from King George Sound and two from Swan River, all collected by Huegel.

E. emarginata (Lindl.) A. S. George, W. Austral. Nat. 9:7 (1963)—

Glossodia emarginata Lindl., gen. et Sp. Orch. Pl. 424 (1840)—

Caladenia emarginata (Lindl.) Reichb. f., Beitr. Syst. Pfl. 67 (1871)—

Type: Swan River, Drummond—holo.:K-L.—

Glossodia intermedia R. Fitzg., Gard. Chron. 17:462 (1882)—

Type: Western Australia. No specimen has been found, so Fitzgerald's plate in Australian Orchids 2, 5 is regarded as the type.

EPIBLEMA

Epiblema R. Br., Prod. 315 (1810).

E. grandiflorum R. Br. Prod. 315 (1810)—

Type: King George Sound, Brown, Dec., 1801—holo.:BM, iso.:K, K-L, E, G, P.

EPIPACTIS

Epipactis porrifolia Swartz, Act. Holm. 1800:233—superfluous name.

Microtis unifolia (Forst. f.) Reichb. f.

ERIOCHILUS

Eriochilus R. Br., Prod. 323 (1810).

E. dilatatus Lindl., Sketch Veg. Swan Riv. Col. 53 (1840)—

Type: Swan River, Mangles—holo.:K-L.—

E. latifolius Lindl., Sketch Veg. Swan Riv. Col. 53 (1840)—

E. dilatatus Lindl. var. *latifolius* (Lindl.) Benth., Fl. Austral. 6:373 (1873)—

Type: Swan River, Drummond—holo.:K-L.—

E. multiflorus Lindl., Sketch Veg. Swan Riv. Col. 53 (1840)—

Type: Swan River, Drummond—holo.:K-L, iso.:K.—

E. dilatatus Lindl. var. *brevifolius* Benth., Fl. Austral. 6:373 (1873)—

Types: Murchison River, Oldfield—lecto.:K; Swan River, Drummond syn.:K.

These names were applied to plants of similar morphology. *E. latifolius* has the leaf well-developed, while the var. *brevifolius* has the leaf at an early stage of development. *E. multiflorus* has a many-flowered inflorescence.

E. dilatatus Lindl. var. *brevifolius* Benth., Fl. Austral. 6:373 (1873)

= **E. dilatatus** Lindl.

E. dilatatus Lindl. var. *latifolius* (Lindl.) Benth., Fl. Austral. 6:373 (1873)

= **E. dilatatus** Lindl.

E. fimbriatus (Lindl.) F. Muell., Wing's South Sci. Rec. 2:152 (1882)

= **Leporella fimbriata** (Lindl.) A. S. George.

E. latifolius Lindl., Sketch Veg. Swan Riv. Col. 53 (1840)

= **E. dilatatus** Lindl.

E. lindleyi Endl. in Lehm., Pl. Preiss. 2:10 (1846)

= *E. scaber* Lindl.

E. multiflorus Lindl., Sketch Veg. Swan Riv. Col. 53 (1840)

= *E. dilatatus* Lindl.

E. scaber Lindl., Sketch Veg. Swan Riv. Col. 53 (1840)—

Type: Swan River, *Drummond*—holo.:K-L, iso.:K.—

E. tenuis Lindl., Sketch Veg. Swan Riv. Col. 53 (1840)—

Type: Swan River, *Drummond*—holo.:K-L.—

E. lindleyi Endl. in Lehm., Pl. Preiss. 2:10 (1846)— *E. scaber* Lindl.
var. *lindleyi* (Endl.) Reichb. f., Beitr. Syst. Pfl. 62 (1871)—

Type: Near Canning River, *Preiss* 2206, July 22, 1839—lecto.:W,
iso.:G, P, W—

E. tenuis Lindl. var. *robustior* Reichb. f., Beitr. Syst. Pfl. 62 (1871)—

Type: King George Sound, *Maxwell*—holo.:W.

E. tenuis is a tall, slender form of *E. scaber*.

E. scaber Lindl. var. *lindleyi* (Endl.) Reichb. f., Beitr. Syst. Pfl. 62 (1871)

= *E. scaber* Lindl.

E. tenuis Lindl., Sketch Veg. Swan Riv. Col. 53 (1840)

= *E. scaber* Lindl.

E. tenuis Lindl. var. *robustior* Reichb. f., Beitr. Syst. Pfl. 62 (1871)

= *E. scaber* Lindl.

EULOPHIA

Eulophia R. Br. ex Lindl., Bot. Reg. t.573 (1821).

E. venosa (F. Muell.) Reichb. f. ex Benth., Fl. Austral. 6:300 (1873)—*Dipodlium*
venosum F. Muell., Fragm. 1:61 (1858)—

Type: near Providence Hill and Macadam Range, N.T., *Mueller*—iso.:K.

GASTRODIA

Gastrodia R. Br., Prod. 330 (1810).

G. sesamoides R. Br., Prod. 330 (1810)—

Type: Port Jackson, N.S.W., *Brown*—holo.:BM.

GLOSSODIA

Glossodia R. Br., Prod. 325 (1810).

G. brunonis Endl., Nov. Stirp. Dec. 2:16 (1839)

= *Elythranthera brunonis* (Endl.) A. S. George.

G. emarginata Lindl., Gen. et Sp. Orch. Pl. 424 (1840)

= *Elythranthera emarginata* (Lindl.) A. S. George.

G. intermedia R. Fitzg., Gard. Chron. 17:462 (1882)

= *Elythranthera emarginata* (Lindl.) A. S. George.

GOADBYELLA

Goadbyella R. S. Rogers, Trans. Roy. Soc. S. Austral. 51:294 (1927).

G. gracilis R. S. Rogers, l.c.—

Type: Pindalup, *P. J. Barwise*, Nov. 1926—holo.:AD, iso.:PERTH.

This is now considered to be an aberrant form of *Microtis alba* R. Br.
See George, W. Austral. Nat. 8, 2:40-41 (1961).

LEPORELLA

Leporella A. S. George, gen. nov. Ab *Caladenia* R. Br. Sect. *Leptoceras* R. Br. planta glabra, tubere 1, foliis 1-2, labello transverse-ovato margine postice recurvo antice fimbriato sine callis, columna post antheram glandibus crassis sessilibus ornata, differt.

Leptoceras R. Fitzg., Austral. Orch. 2, 4 (1889), nom. illeg., non (R. Br.) Lindl., Sketch Veg. Swan Riv. Col. 53 (1840).

Type species: **Leporella fimbriata** (Lindl.) A. S. George. comb. nov.

Basionym: *Leptoceras fimbriata* Lindl., Sketch Veg. Swan Riv. Col. 53 (1840)—*Caladenia fimbriata* (Lindl.) Reichb. f., Beitr. Syst. Pfl. 65 (1871)—*Eriochilus fimbriatus* (Lindl.) F. Muell., Wing's South. Sci. Rec. 2:152 (1882)—

Type: Swan River, *Drunmond*—holo.:K-L.

Taxonomic synonym: *Leptoceras pectinata* Lindl., Sketch Veg. Swan Riv. Col. 53 (1840)—

Type: Swan River, *Drunmond*—holo.:K-L.

Leptoceras (R. Br.) Lindl. was based on *Caladenia* Sect. *Leptoceras* R. Br. which included two species, *C. menziesii* R. Br. and *C. macrophylla* R. Br. The latter is now regarded as synonymous with *C. menziesii* which is thus the type species for the Section. Lindley retained both species and added *L. fimbriata*, *L. oblonga* and *L. pectinata*. Bentham placed all five in *Caladenia* Sect. *Leptoceras*. Robert Fitzgerald was the first to regard *Leptoceras fimbriata* Lindl. as constituting a monotypic genus, but unfortunately he retained this generic name. He thus excluded the type species of the name *Leptoceras* (R. Br.) Lindl., and his name must be regarded as a later homonym. As *Leptoceras* is correctly used for a section of *Caladenia* there is no case for having it conserved. The name *Leporella* is derived from the Latin *lepus*, *leporis*, a hare, in reference to the vernacular name for this orchid.

LEPTOCERAS (R. BR.) LINDL.

Leptoceras (R. Br.) Lindl. Sketch Veg. Swan Riv. Col. 53 (1840)—

Caladenia R. Br. Sect. **Leptoceras** R. Br., Prod. 325 (1810).

L. fimbriata Lindl., Sketch Veg. Swan Riv. Col. 53 (1840)

= **Leporella fimbriata** (Lindl.) A. S. George.

L. macrophylla (R. Br.) Lindl., Gen. et Sp. Orch. Pl. 416 (1840)

= **Caladenia menziesii** R. Br.

L. menziesii (R. Br.) Lindl., Gen. et Sp. Orch. Pl. 416 (1840)

= **Caladenia menziesii** R. Br.

L. oblonga Lindl., Sketch Veg. Swan Riv. Col. 53 (1840)

= **Caladenia menziesii** R. Br.

L. pectinata Lindl., Sketch Veg. Swan Riv. Col. 53 (1840)

= **Leporella fimbriata** (Lindl.) A. S. George.

L. pectinata Endl. in Lchm., Pl. Preiss. 2:6 (1846).

This is cited by Bentham, Fl. Austral. 6:374, and in Index Kewensis. However, Endlicher, l.c., refers to *Leptoceras pectinata* Lindl., though his description is of *Lyperanthus nigricans* R. Br.

LEPTOCERAS R. FITZG.

Leptoceras R. Fitzg. Austral. Orch. 2, 4 (1889), nom. illeg., non (R. Br.) Lindl.
= **Leporella** A. S. George.

LYPERANTHUS

Lyperanthus R. Br., Prod. 325 (1810).

L. forrestii F. Muell., Wing. South. Sci. Rec. 2:55 (1882)—

Type: Near the Stirling Range, *J. Forrest*—iso.:K.

L. nigricans R. Br., Prod. 325 (1810)—

Caladenia nigricans (R. Br.) Reichb. f., Beitr. Syst. Pfl. 67 (1871)—

Type: Port Jackson, *R. Brown*, Oct. 1803—holo.:BM, iso.:K.—

Lyperanthus nigricans R. Br. forma *pumila* Domin, Journ. Linn. Soc. (Bot.) 41:251 (1912)—

Type: Mt. Toolbrunup, *Dorrien-Smith*, 1909—holo.:K. This is simply a short specimen.

L. nigricans R. Br. forma *pumila* Domin, Journ. Linn. Soc. (Bot.) 41:251 (1912)
= *L. nigricans* R. Br.

L. serratus Lindl., Gen. et Sp. Orch. Pl. 393 (1840)—

Caladenia serrata (Lindl.) Reichb. f., Beitr. Syst. Pfl. 67 (1871)—

Type: Swan River, *Drummond*—holo.:K-L.

MACDONALDIA

Macdonaldia Gunn ex Lindl., Sketch Veg. Swan Riv. Col. 50 (1840)

— *Thelymitra* J. R. et G. Forster.

M. antennifera Lindl., Sketch Veg. Swan Riv. Col. 50 (1840)

— *Thelymitra antennifera* (Lindl.) Hook. f.

M. concolor Lindl., Sketch Veg. Swan Riv. Col. 50 (1840)

Thelymitra flexuosa Endl.

M. spiralis Lindl., Sketch Veg. Swan Riv. Col. 50 (1840)

— *Thelymitra spiralis* (Endl.) F. Muell.

M. variegata Lindl., Sketch Veg. Swan Riv. Col. 50 (1840)

Thelymitra variegata (Lindl.) F. Muell.

MICROTIS

Microtis R. Br., Prod. 320 (1810).

M. alba R. Br., Prod. 321 (1810)—

Type: King George Sound, *R. Brown*, Dec. 1801—holo.:BM, iso.:K.

M. atrata Lindl., Sketch Veg. Swan Riv. Col. 54 (1840)—

Type: Swan River, *Drummond*—holo.:K-L, iso.:K—

M. atrata Lindl. var. *viridula* Reichb. f., Beitr. Syst. Pfl. 62 (1871)—

Types: Swan River, *Preiss*, 2403—lecto.:W; Australia *felix* F. Mueller syn.:W. The granular surface of the labellum by which the variety was distinguished, is typical of the species.

M. atrata Lindl. var. *viridula* Reichb. f., Beitr. Syst. Pfl. 62 (1871)

= *M. atrata* Lindl.

M. brownii Reichb. f., Beitr. Syst. Pfl. 24 (1871)—

Type: In paludibus ad portum Regis Georgii III, *R. Brown*, Dec. 1801—lecto.:K.—

M. truncata R. S. Rogers, Trans. Roy. Soc. S. Austral. 44:326 (1920)—

Types: Diamond Tree School, near Jarnadup, *Miss I. Knox-Peden*, Dec. 1918—lecto.:AD; Greenbushes, *R. Pulleine*, Dec. 8, 1917—syn.:not seen; Albany, *A. Syme Johnson*, Dec. 4, 1919—syn.:not seen.

The specimen selected as Lectotype of *M. brownii* is one of two on a sheet at K, collected at King George Sound by Brown. This specimen matches a sketch by Reichenbach f. on a sheet at W, and agrees with his description better than the other specimen on the K sheet. There are two sheets at W named *M. brownii* by Reichenbach, but neither is apparently a Brown collection nor do the specimens fit the description of *brownii*—"labellum late ligulatum . . . callus ligulatus ante apicem in disco." Another specimen of Brown's from King George Sound was found at E, on a sheet with *Cryptostylis ovata* R. Br. It agrees with the lectotype and is probably an isotype.

M. gymmadienioides Diels, Journ. Muell. Bot. Soc. W. Austral. no. 11:79 (1903) = *M. pulchella* R. Br. This is the correct spelling of the epithet, not *gymmadienioides*.

M. media R. Br., Prod. 321 (1810)

Type: King George Sound, *Brown*, Dec. 1801—holo.:BM, iso.:BM. One of the *M. unifolia* complex.

M. orbicularis R. S. Rogers, Trans. Roy. Soc. S. Austral. 31:63 (1907)—

Type: Myponga, S.A. *Rogers*, Nov. 2, 1906—holo.:AD, iso.:BM, PERTH NSW.

M. parviflora R. Br., Prod. 321 (1810). Recorded for Western Australia by Rogers in Black, Fl. S. Austral. 123 (1922) but the typical form does not occur in this State.

M. parviflora R. Br. var. *densiflora* Benth., Fl. Austral. 6:348 (1873)—

Type: W. Australia, *Drummond* 117, 1849—holo.:K. One of the *M. unifolia* complex.

M. porrifolia (Swartz) Spreng., Syst. Veget. 3:713 (1826)—

Based on *Epipactis porrifolia* Swartz, Act. Holm. 1800: 233, a superfluous name for *Ophrys unifolia* Forst. f.

M. pulchella R. Br. Prod. 321 (1810)—

Type: King George Sound, *R. Brown*, Dec. 1801—holo.:BM, iso.:K—

M. gymmadienioides Diels, Journ. Muell. Bot. Soc. W. Austral. no. 11:79 (1903)—

Type: Near Albany, *Diels*, Nov. 1901—not seen. Diels did not see Brown's specimens, and his characters for distinguishing *M. gymmadienioides* in fact fall down when a range of specimens is examined.

M. truncata R. S. Rogers, Trans. Roy. Soc. S. Austral. 44:326 (1920)—

= *M. brownii* Reichb. f.

M. unifolia (Forst. f.) Reichb. f., Beitr. Syst. Pfl. 62 (1871)—*Ophrys unifolia* Forst. f., Flor. Ins. Aust. Prod. 59 (1786)—

Type: New Zealand, *Forster*—holo.:GOET, iso.:P. At present this name is used for a multitude of forms in Australia. No western specimens quite match the Type, though some are very close. *M. media* and *M. parviflora* var. *densiflora* belong to this complex and several eastern forms have also received names.

M. porrifolia (Swartz) Spreng., Syst. Veget. 3:713. based on *Epipactis porrifolia* Swartz, Act. Holm. 1800:233, is a superfluous name for *Ophrys unifolia* Forst. f.

MONADENIA

Monadenia Lindl., Gen. et Sp. Orch. Pl. 356 (1838).

M. australiensis Rupp, Austral. Orch. Rev. 11, 3:70 (1946)—

= *M. micrantha* Lindl.

M. micrantha Lindl., Gen. et Sp. Orch. Pl. 357 (1838)—

Types: Cape of Good Hope, *Thom*—syn.:K-L; Cape of Good Hope, *Burchell* 6139; Nieuwekloof and Ruigtevalei, *Drège*—syn.:K-L.—

M. australiensis Rupp, Austral. Orch. Rev. 11, 3:70 (1946)—

Type: Youngs Siding, *Miss D. Sontherland*, Nov. 1944—holo.:PERTH.
Introduced into South-western Australia from South Africa.

NERVILIA

Nervilia Commerson ex Gaud., in Freycinet, Voy. Uran. et Phys. (Bot.) 421 (1829), t.53 (1827).

N. holochila (F. Muell.) Schlechter, Engl. Bot. Jahrb. 39:48 (1906)—*Pogonia holochila* F. Muell., Fragm. 5:200 (1866)—

Type: Rockingham Bay, Qld., *Dallachy*—iso.:K.

OPHRYS

Ophrys unifolia Forst. f., Flor. Ins. Aust. Prod. 59 (1786)—

= *Microtis unifolia* (Forst. f.) Reichb. f.

POGONIA

Pogonia holochila F. Muell., Fragm. 5:200 (1866).

= *Nervilia holochila* (F. Muell.) Schlechter.

PRASOPHYLLUM

Prasophyllum R. Br., Prod. 317 (1810).

P. attenuatum R. Fitzg., Gard. Chron. 17:495 (1882)

= *P. ovale* Lindl. var. *ovale*.

Note: *P. attenuatum* R. Fitzg., Journ. Bot. 23:136 (1885) which was applied to an eastern Australian plant, is a later homonym.

P. australe R. Br., Prod. 318 (1810). Recorded for Western Australia by Rogers in Black, Fl. S. Austral. 1:125 (1922) but the typical form does not occur in this State, while the var. *sargentii* is considered to warrant specific rank.

P. australe R. Br. var. *sargentii* W. H. Nicholls, Vict. Nat. 65:268 (1949)

P. sargentii (W. H. Nicholls) A. S. George.

P. brownii Reichb. f., Beitr. Syst. Pfl. 16 (1871)—

Type: ad portum Regis Georgii III in palud., *R. Brown*, Dec. 1810—
There is no specimen in the Reichenbach collection at W, but one at BM has the above locality in Brown's hand and agrees with the description. It is here chosen as lectotype. Reichenbach's published illustration in *Xenia Orchidacea*, t.198, is not very accurate; his original sketch (at W) is better.

P. ellipticum R. S. Rogers, Trans. Roy. Soc. S. Austral. 44:325 (1920)—

Type: Near Jarnadup, *Miss I. Knox-Peden*, Dec. 21, 1918—holo.:AD.
Roger's type agrees very well with that of *P. brownii*.

P. cucullatum Reichb. f., Beitr. Syst. Pfl. 59 (1871)

= *P. gibbosum* R. Br.

P. cyphochilum Benth., Fl. Austral. 6:340 (1873)—

Types: Upper Kalgan, *Oldfield* 593—lecto.:K, iso.:MEL; Porongurup, *F. Mueller*, Oct. 1867—syn.:MEL.

The other collections cited by Bentham—Darling Range, *Collie*; Swan River, *Oldfield*; and King George Sound, *Muir*—represent *Prasophyllum hians* Reichb. f. Bentham's description applies better to the collections from Upper Kalgan and Porongurup.

P. drummondii Reichb. f., Beitr. Syst. Pfl. 69 (1871)—

Type: Swan River, *Drummond* 181—holo.:W, iso.:W. The holotype sheet has Reichenbach's sketches.—

P. muelleri C. Andrews, Journ. Muell. Bot. Soc. W. Austral. no. 9:19 (1902)—*P. elatum* R. Br. var. *muelleri* (C. Andrews) W. H. Nicholls, Vict. Nat. 65:270 (1949)—

Type: Guildford, *Andrews*, Nov.—holo.:PERTH, iso.:K. PERTH.—

P. paludosum W. H. Nicholls, Vict. Nat. 64:172 (1948)—

Type: Bayswater, *W. H. Nicholls*, 1946—holo.:MEL, iso.:PERTH.

P. elatum R. Br. Prod. 318 (1810)—

Type: Port Jackson, N.S.W., *Brown*, Sept-Oct. 1803—holo.:BM, iso.:E, K.—

P. macrotys Lindl., Sketch Veg. Swan Riv. Col. 54 (1840)—

Type: Swan River, *Drummond*—holo.:K-L, iso.:K.

P. elatum R. Br. var. *muelleri* (C. Andrews) W. H. Nicholls, Vict. Nat. 65:270 (1949)

— ***P. drummondii*** Reichb. f.

P. ellipticum R. S. Rogers, Trans. Roy. Soc. S. Austral. 44:325 (1920)

P. brownii Reichb. f.

P. fimbria Reichb. f., Beitr. Syst. Pfl. 60 (1871)—

Types: Swan River, *Drummond* 848—lecto.:W, iso.:W; Swan River, *Preiss* 2215, July 26, 1839—syn.:W; Vasse River, *Oldfield*—not seen.—

P. gracillimum W. H. Nicholls, Vict. Nat. 64:175 (1948)—

Type: Yarloop, *Mrs. E. Scouler*, Oct. 1944—holo.:MEL, iso.:PERTH. Nicholls' specimens are rather slender, with the inner plate of the labellum less developed than in the typical form, but otherwise they agree very well. The inner plate is more prominent than it appears in his illustration.

P. fuscoviride Reader, Vict. Nat. 14:163 (1898)

P. nigricans R. Br.

P. gibbosum R. Br., Prod. 318 (1810)—

Type: King George Sound, *R. Brown*, Dec. 1801—holo.:BM; iso.:K, P, PERTH.—

P. cucullatum Reichb. f., Beitr. Syst. Pfl. 59 (1871)—

Types: Stirling Terrace (Albany), *Preiss* 2211, Sept. 22, 1840—lecto.:W, syn.:FI, G, L, P, W; Swan River, *Drummond* 5,443—syn.:G, P, W, K-L. *P. cucullatum* is within the range of variation of *P. gibbosum*.

P. giganteum Lindl., Sketch Veg. Swan Riv. Col. 54 (1840)—

Type: Swan River, *Drummond*—holo.:K-L, iso.:K.

P. giganteum Endl., cited in Index Kewensis, is an error, as Endlicher cites *P. giganteum* Lindl.

P. gracile Lindl., Sketch Veg. Swan Riv. Col. 54 (1840)

P. macrostachyum R. Br. var. *macrostachyum*.

P. gracile Lindl. var. *ringens* Reichb. f., Beitr. Syst. Pfl. 60 (1871)

= ***P. macrostachyum*** R. Br. var. *ringens* (Reichb. f.) A. S. George.

P. gracillimum W. H. Nicholls, Vict. Nat. 64:175 (1948)

— *P. fimbria* Reichb. f.

P. grimwadeanum W. H. Nicholls, Vict. Nat. 64:175 (1948)—

Type: Middleton Beach, Albany, Nicholls, Oct. 1946—holo.:MEL.

This belongs to a complex including *P. brownii*, *P. giganteum*, *P. lanceolatum*, *P. regium* and *P. triangulare*, all of which require extensive study.

P. hians Reichb. f., Beitr. Syst. Pfl. 61 (1871)—

Types: Swan River, Drummond 851—lecto.:W, iso.:BM, W; Drummond 175—syn.:W; Drummond 180—syn.:W; Swan River, Preiss s.n.—syn.:W; King George Sound, Huegel—syn.:W.

P. horburyanum Rupp, Vict. Nat. 59:122 (1942)

— *P. nigricans* R. Br.

P. lanceolatum R. S. Rogers, Trans. Roy. Soc. S. Austral. 44:325 (1920)—

Types: Albany, A. Syme Johnson, Sept. 25, 1919—lecto.:AD; Muresk, Mrs. W. E. Cooke, Sept. 4, 1907—syn.:AD.

P. macrostachyum R. Br. Prod. 318 (1810).

var. *macrostachyum*—

Type: King George Sound, Brown, Dec. 1801—holo.:BM, iso.:K.—

P. gracile Lindl., Sketch Veg. Swan Riv. Col. 54 (1840)—

Type: Swan River, Drummond—holo.:K-L. The Drummond specimens are much shorter than Brown's, but similar morphologically.

var. *ringens* (Reichb. f.) comb. nov.

Basionym: *Prasophyllum gracile* Lindl., var. *ringens* Reichb. f., Beitr. Syst. Pfl. 60 (1871)—

Type: York, Preiss 2198—lecto.:W. Reichbenbach cited no collection but referred to Endlicher's description of *P. gracile* Lindl., in Lehm. Pl. Preiss. 2:13. where the above Preiss collection is cited.

P. macrotys Lindl., Sketch Veg. Swan Riv. Col. 54 (1840)

— *P. elatum* R. Br.

P. muelleri C. Andrews, Journ. Muell. Bot. Soc. W. Austral. no. 9:19 (1902)

— *P. drummondii* Reichb. f.

P. nigricans R. Br., Prod. 319 (1810)—

Type: Bay X, R. Brown, March 3, 1802—holo.:BM. Bay X is Port Lincoln, S.A.—

P. fuscoviride Reader, Vict. Nat. 14:163 (1898)—

Type: Lowan, Dimboola Shire, Miss F. Reader, 1892—holo.:MEL.—

P. horburyanum Rupp, Vict. Nat. 59:122 (1942)—

Type: Kumarl, W.A., L. Horbury, May, 1938—holo.:NSW (87484), iso.:PERTH.

Much confusion has surrounded the correct identity of *P. nigricans*. Examination of the Type showed that it is the same as *P. fuscoviride*, of which *P. horburyanum* has already been reduced to a synonym (George, W. Austral. Nat. 8, 2:39 (1961)). This is the only species of the Section *Micranthum* known to occur in Western Australia, and on Eyre Peninsula where the Type was collected.

P. ovale Lindl., Sketch Veg. Swan Riv. Col. 54 (1840).

var. *ovale*

Type: Swan River, Drummond—lecto.:K-L. The sheet contains one specimen of *P. ovale* and three of *P. hians* Reichb. f. The *ovale* specimen

agrees with Lindley's description in the obtuse, free lateral sepals and in the form of the labellum. There is also a sketch of the labellum of this specimen on the sheet.—

P. attenuatum R. Fitzg., Gard. Chron. 17:495 (1882)—

Type: Western Australia, *Fitzgerald*. There is a sheet at BM with the locality "Green Mount, Sept.", in Fitzgerald's hand. It agrees with the description and is therefore selected as lectotype. An unpublished plate by Fitzgerald in the Mitchell Library, Sydney, has the locality "Bunbury 15th Sep".

var. **triglochin** Reichb. f., Beitr. Syst. Pfl. 60 (1871)—

Type: Swan River, *Drummond* 854—holo.:W, iso.:K, W.—

P. plumaeforme R. Fitzg., Gard. Chron. 1:495 (1882)—

Type: Western Australia, *Fitzgerald*. Fitzgerald cited no collection but there is a sheet at BM labelled "King River, Western Australia, Sept." in his hand. This agrees with his description and is selected as lectotype. An unpublished plate by Fitzgerald in the Mitchell Library, Sydney, has the localities "Greenhill, Perth, Albany 17 Aug".

P. paludosum W. H. Nicholls, Vict. Nat. 64:172 (1948)

— **P. drummondii** Reichb. f.

P. parvifolium Lindl., Sketch Veg. Swan Riv. Col. 54 (1840)—

Types: Swan River, *Drummond*—lecto.:K-L, iso.:K; Cape Leeuwin, *Collie*—syn.:K-L.

P. plumaeforme R. Fitzg., Gard. Chron. 1:495 (1882)

— **P. ovale** Lindl. var. **triglochin** Reichb. f.

P. regium R. S. Rogers, Trans. Roy. Soc. S. Austral. 42:27 (1918)—

Type: Near Diamond Tree, Manjimup, *R. Pulleine*, Dec. 1917—holo.:AD.

P. sargentii (W. H. Nicholls) A. S. George, stat. nov.

Basionym: *Prasophyllum australe* R. Br. var. *sargentii* W. H. Nicholls, Vict. Nat. 65:268 (1949)—

Type: Near Beverley, *Nicholls*, Sept. 1948—holo.:MEL. The differences from the typical *P. australe* are sufficient to raise this taxon to specific rank. It is usually a robust plant, with a distinctive short leaf. The differences include larger floral bracts (7-12 mm long, compared with 4-7 mm in *australe*); white lateral sepals (green and brown in *australe*); the inner plate of the labellum ending in two obtuse projections, much larger than in *australe*; and a differently shaped column. These features are well shown in Nicholls' "Orchids of Australia" (1969) pl. 113. Although colour is often an unreliable character it appears to be constant in this species. *P. sargentii* is endemic in Western Australia, while *P. australe* has not been recorded here.

P. triangulare R. Fitzg., Gard. Chron. 1:495 (1882)—

Type: Western Australia, *Fitzgerald*. At BM there is a sheet labelled "Prasophyllum triangulare, Albany, Western Australia Oct." in Fitzgerald's hand. This is selected as lectotype.

PTEROSTYLIS

Pterostylis R. Br. Prod. 326 (1810).

P. allantoidea R. S. Rogers, Trans. Roy. Soc. S. Austral. 64:139 (1940)—

Type: Kumarl, *L. Horbury*, Sept. 1938—holo.:AD, iso.:PERTH, NSW.

P. angusta A. S. George, Nuytsia 1,2:164 (1971)—

Type: West of Mt. Trio, Stirling Range, W.A., in clay-quartzite soil, in wandoo woodland, *A. S. George* 9480, Aug. 2, 1969—holo.:PERTH, iso.:MEL, NSW, K.

- P. barbata** Lindl., Sketch Veg. Swan Riv. Col. 53 (1840)—
Types: Swan River, *Drummond*—lecto.:K-L, iso.:K; King George Sound, *A. Collie*—syn.:K-L.—
P. turfosa Endl. in Lehm., Pl. Preiss 2-5 (1846)—
Type: Stirling Terrace (Albany), *Preiss* 2632, Sept. 20, 1840—holo.:LD.
 The single specimen is very small and slender, but represents the same taxon as *P. barbata*.
Pterostylis barbata Endl. in Lehm., Pl. Preiss. 2:5 (1846) is cited in Bentham, Fl. Austral. 6:357, but this is an error, as Endlicher refers to *P. barbata* Lindl.
- P. constricta* O. H. Sargent, Journ. W. Austral. Nat. Hist. Soc. 2,4:24 (1907)
 = **P. scabra** Lindl. var. **scabra**.
- P. hamiltonii* W. H. Nicholls, Vict. Nat. 50:89 (1933)
 = **P. scabra** Lindl. var. **robusta** (R. S. Rogers) A. S. George.
- P. mitchellii** Lindl. in Mitch., Journ. Trop. Austral. 365 (1848)—
P. rufa R. Br. var. *mitchellii* (Lindl.) R. Fitzg. in Moore and Betche, Handb. Fl. N.S.W. 401 (1893)—
Type: Mt. Kennedy, Qld., *Mitchell*—holo.:K-L, with the locality "Range SE of Camp 29, Sept. 27." See note under *Pterostylis rufa*.
- P. mutica** R. Br., Prod. 328 (1810)—
Type: Port Jackson, *Brown*—holo.:BM, iso.:K.
- P. nana** R. Br., Prod. 327 (1810)—
Type: Port Dalrymple, *Paterson*—holo.:BM.—
P. pyramidalis Lindl., Sketch Veg. Swan Riv. Col. 53 (1840)—*P. nana* R. Br. var. *pyramidalis* (Lindl.) Ewart, Proc. Roy. Soc. Vict. 24:72 (1911)—
Type: Swan River, *Drummond*—holo.:K-L.
- P. plumosa** L. I. Cady, Austral. Pl. 5, 39:138 (1969)—
Type: Road to Abercrombie Caves, *W. Brinsley*, Oct. 1961—holo.:NSW, iso.:Herb. L. I. Cady 1614 (not seen). Forms very similar to this taxon occur in Western Australia, e.g. Youngs Siding, near Albany, *Miss R. Sandilands*, Sept. 16, 1932; 15 miles west of Pemberton, *M. C. George*, Oct. 25, 1959.
- P. pusilla** R. S. Rogers, Trans. Roy. Soc. S. Austral. 42:26 (1918)—
Types: Geranium, S.A., *Nora E. Jacob*, Oct. 1917—lecto.:AD, iso.:K (1 flower); Wirrega, S.A., *T. G. Osborn*—not seen; Grampians, Vic., *C. Walter*—not seen; Greensborough, Vic., *E. Pescott*—not seen; Blackburn, Vic., *D. Coleman*—not seen. See note under *P. rufa* R. Br.
- P. pyramidalis* Lindl., Sketch Veg. Swan Riv. Col. 53 (1840)
 = **P. nana** R. Br.
- P. pyramidalis* Endl. in Lehm. Pl. Preiss. 2:5 (1846). This is cited by Bentham, Fl. Austral. 6:359, but Endlicher cites *P. pyramidalis* Lindl., though his description is of *P. scabra* Lindl. var. *robusta*.
- P. recurva** Benth., Fl. Austral. 6:360 (1873)—
Type: Swan River, *Drummond*—lecto.:K; Upper Hay River, *Miss Warburton*—syn.:K.
- P. reflexa* R. Br. var. *constricta* (O. H. Sargent) Ewart, White et Tovey, Journ. Roy. Soc. N.S. Wales 42:193 (1908)—*P. constricta* O. H. Sargent.
 = **P. scabra** Lindl. var. **scabra**.

P. robusta R. S. Rogers, Trans. Roy. Soc. S. Austral. 51:296 (1927)
= *P. scabra* Lindl. var. *robusta* (Rogers) A. S. George.

P. rogersii E. Coleman, Viet. Nat. 44:100 (1929)—

Types: Bunbury and Collie, *Miss I. Banks*, July, 1929; Busselton, *E. Bryant*, June 1928 and July 1929; *B. T. Goadby* July 1929. The citation of Goadby as a collector is probably an error, as the specimens were only forwarded by him. There is one sheet at MEL—1002452—with all the above details except the locality Collie. It is now impossible to assign the specimens to the collectors and the whole sheet is therefore selected as Lectotype. Another sheet at MEL—1002453—has two syntype specimens, and one collected by Miss Banks in June, 1928.

P. rufa R. Br. Prod. 327 (1810)—

Type: Port Jackson, *Brown*—holo.:BM, iso.:Fl, G, K, L, P.—

P. squamata R. Br. Prod. 327 (1810)—*P. rufa* R. Br. var. *squamata* (R. Br.) R. Fitz. in Moore and Betche, Handb. Fl. N.S.W., 401 (1893)—

Type: Table Mountain, Tas., *Brown*—holo.:BM.

A revision of the “*rufa*” group by Blackmore and Clemesha in the Orchadian 2, 12: 148-166 (1968) goes a long way towards resolving this difficult group, though some of the conclusions are doubtful. However, the treatment scarcely touches on the Western Australian forms, all of which show differences in varying degree from the eastern ones. Much work is still required here.

P. rufa R. Br. var. *mitchellii* (Lindl.) R. Fitzg. in Moore et Betche Handb. Fl. N.S.W. 401 (1893)

= *P. mitchellii* Lindl.

P. rufa R. Br. var. *squamata* (R. Br.) R. Fitzg. in Moore et Betche Handb. Fl. N.S.W. 401 (1893)

= *P. rufa* R. Br.

P. rupestris Drummond, Journ. Bot. (Hook) 2:367 (1840)—*Nomen nudum*.

P. sargentii C. Andrews, Journ. W. Austral. Nat Hist. Soc. 2,2:57 (1905)—

Type: York *O. H. Sargent*, July and Aug. 1904. The collections from York in July-August 1904 have been found, and these are designated as follows: lecto.:York, *O. H. Sargent*, Aug. 1904.—PERTH, ex W. E. Blackall Collection, named by C. Andrews; syn.:Cut Hill near York, *O. H. Sargent*, Aug. 7, 1904—PERTH, NSW.; syn.:York, *O. H. Sargent*, July 1904—NSW, ex C. Andrews Collection.

P. scabra Lindl., Sketch Veg. Swan Riv. Col. 53 (1840).

var. *scabra*—

Type: Swan River, *Drummond*—holo.:K-L—

P. constricta O. H. Sargent, Journ. W. Austral. Nat. Hist. Soc. 2,4:24 (1907)—*P. reflexa* R. Br. var. *constricta* (Sargent) Ewart, White et Tovey, Journ. & Proc. Roy. Soc. N.S. Wales 42:193 (1908)—

Type: Kindelans Road, near York, *O. H. Sargent*, July 21, 1907—lecto.:PERTH. Sargent cited no definite collection, but this sheet has one of his labels and agrees with his description.

var. *robusta* (Rogers) comb. et stat. nov.—

Basionym: *P. robusta* R. S. Rogers, Trans. Roy. Soc. S. Austral. 51:296 (1927)—

Type: National Park, Belair, S.A., *R. S. Rogers*, May 28, 1905—lecto.:AD.

This collection is marked type, in Rogers' hand. He also cited two W.A. localities—between Perth and Fremantle, *Goadby*, July 1927, and Swanbourne, *Goadby*, July 7, 1927—

P. hamiltonii W. H. Nicholls, Vict. Nat. 50:89 (1933)—

Type: Boyup Brook, *Miss E. Corker*, June-July 1927–30—syn.:PERTH (Coll. June 1928).

P. scabra at present includes a number of forms, some of which connect the typical one with the var. *robusta*.

P. hamiltonii differs from the typical var. *robusta* only in having a longer labellum, but this feature is extremely variable.

P. squamata R. Br., Prod. 327 (1810)

= *P. rufa* R. Br.

P. turfosa Endl. in Lehm., Pl. Preiss 2:5 (1846)

= *P. barbata* Lindl.

P. vittata Lindl., Sketch Veg. Swan Riv. Col. 53 (1840).

var. **vittata**

Types: Interior of King George Sound, *A. Collie*—lecto.:K-L, iso.:K; W. Australia, *Henslow*—syn.:K-L—

P. vittata Lindl. var. *viridiflora* W. H. Nicholls, Vict. Nat. 49:254 (1933)—

Type: Boyup Brook, *Miss E. Corker*, July-Aug.—holo.:not seen.

The Collie specimen selected as lectotype of var. *vittata* is the best of those in the Lindley collection. It has green flowers, though some of the others are brown (but are not the large-flowered form, var. *subdifformis*).

var. *major* Endl. in Lehm., Pl. Preiss 2:5 (1846)—nomen nudum.

var. *minor* Endl. in Lehm., Pl. Preiss 2:5 (1846)—nomen nudum.

var. *subdifformis* W. H. Nicholls, Vict. Nat. 49:253 (1933)—

Type: Boyup Brook, *Miss E. Corker*, July-Aug.—iso.:PERTH.

var. *viridiflora* W. H. Nicholls, Vict. Nat. 49:254 (1933)

= *P. vittata* Lindl. var. **vittata**.

RHIZANTHELLA

Rhizanthella R. S. Rogers, Journ. Roy. Soc. W. Austral. 15:1 (1928).

R. gardneri R. S. Rogers, l.c.—

Types: Corrigin, *J. Trott*, May 23, 1928—syn.:PERTH; Shackleton, *J. H. Plant*, June 1928—not seen; Goomalling June, 1928—syn.:PERTH.

SPICULAEA

Spiculaea Lindl., Sketch Veg. Swan Riv. Col. 56 (1840).

S. ciliata Lindl., l.c. 56 (1840)—*Drakaea ciliata* (Lindl.) Reichb. f., Beitr. Syst. Pfl. 68 (1871)—

Type: Swan River, *Drummond*—holo.:K-L, iso.:FI, G, K.

THELYMITRA

Thelymitra J. R. et G. Forster, Char. Gen. 97 t.49 (1776).—

Macdonaldia Gunn ex Lindl.

T. antennifera (Lindl.) Hook. f., Fl. Tasm. 2:4 (1858)—

Macdonaldia antennifera Lindl., Sketch Veg. Swan Riv. Col. 50 (1840)—

Types: Swan River, *Drummond*—lecto.:K-L; Augusta, *Mrs. Molloy*—syn.:K-L.

The authorship is sometimes given as Gunn ex Lindl., but there are no Tasmanian specimens in the Lindley collection and he cites only the two above collections in Gen. et Sp. Orch. Pl. 385 (1840). The epithet is almost certainly Lindley's own.

T. aristata Lindl., Gen. et Sp. Orch. Pl. 521 (1840). Recorded for Western Australia by Bentham (Fl. Austral. 6:319), and later workers, but the name has been misapplied to forms of the *Thelymitra nuda* complex, and the species does not occur here. *T. aristata* Lindl. is the correct name for the species previously known (e.g. Nicholls 1951, 1969) as *T. grandiflora* R. Fitzg., Gard. Chron. 1:495 (1882), which must be reduced to synonymy.

T. azurea R. S. Rogers, Trans. Roy. Soc. S. Austral. 41:342 (1917)

= **T. canaliculata** R. Br.

T. benthamiana Reichb., f., Beitr. Syst. Pfl. 55 (1871)

= **T. fuscolutea** R. Br. var. **fuscolutea**

T. campanulata Lindl., Sketch Veg. Swan Riv. Col. 59 (1840)—

Type: Swan River, *Mangles*—lecto.:K-L. This is the only specimen in the Lindley collection which agrees with his description. It is annotated by him but is not cited in the Gen. et Sp. Orch. Pl. 521 (1840), where Swan River, *Drummond* is given.

T. canaliculata R. Br., Prod. 314 (1810)—

Type: King George Sound, *R. Brown*, Dec. 1801—holo.:BM.—

T. azurea R. S. Rogers, Trans. Roy. Soc. S. Austral. 41:342 (1917)—

Type: Between Mt. Compass and Victor Harbour, *Rogers*, Nov. 19, 1916—holo.:AD. iso.:NSW. Rogers' specimens are shorter and more robust than Brown's but the floral morphology is the same. Both forms occur in Western Australia.

T. carnea R. Br., Prod. 314 (1810)—

Type: Towards George's River and near Parramatta, *R. Brown*, Oct.-Nov. 1803—holo.:BM. The western specimens do not quite match these but are left under this name for the present.

T. cornicina Reichb., f., Beitr. Syst. Pfl. 54 (1871)—

Type: King George Sound, *Maxwell*—holo.:W.—

T. fasciculata R. Fitzg., Austral. Orch. 3, 2 (1888)—

Type: Fitzgerald cited no collection and none has been found. His plate is therefore regarded as the type.

Reichenbach's type is a single specimen (that illustrated in Xen. Orch. 2, t.196) but it is in good condition. It is smaller than that figured by Fitzgerald, but the two agree otherwise morphologically.

T. crinita Lindl., Sketch Veg. Swan Riv. Col. 49 (1840)—

Type: Swan River, *Drummond*—holo.:K-L.

T. cucullata H. M. R. Rupp, Austral. Orch. Rev. 11:71 (1946)—

Type: Youngs Siding, *Miss D. Southerland*, Aug. 1945—holo.:NSW. (87492), iso.:PERTH.

T. dedmanae R. S. Rogers, Trans. Roy. Soc. S. Austral. 62:13 (1938)

= **T. fuscolutea** R. Br. var. **stellata** (Lindl.) A. S. George.

T. fasciculata R. Fitzg., Austral. Orch. 2, 3 (1888)
= *T. cornicina* Reichb. f.

T. flexuosa Endl., Nov. Stirp. Dec. 23 (1839)—

Type: King George Sound, *Huegel*—holo.:W.—

Macdonaldia concolor Lindl., Sketch Veg. Swan Riv. Col. 50 (1840)—

Type: King George Sound, *A. Collie*—holo.:K-L, iso.:K.—

Macdonaldia smithiana Gunn ex Lindl., Sketch Veg. Swan Riv. Col. 50 (1840)—

Type: Circular Head, Tas., *Gunn* 945—holo.:K-L, iso.:K, L, P, W.

T. fuscolutea R. Br., Prod. 315 (1810)—

var. *fuscolutea*—

Type: King George Sound, *R. Brown*, Dec. 1801—holo.:BM.—

T. benthamiana Reichb. f., Beitr. Syst. Pfl. 55 (1871)—

Types: Swan River, *Drummond* 825—lecto.:W, iso.:G, W; *Drummond* 145—syn.:W. The specimen selected as lectotype is that which *Reichenbach* figured in *Xen. Orch.* 2, t.199.

var. *stellata* (Lindl.) comb. et stat. nov.

Basionym: *Thelymitra stellata* Lindl., Sketch Veg. Swan Riv. Col. 49 (1840)—

Type: Swan River, *Drummond*—holo.:K-L, iso.:K, Fl.—

T. dedmanae R.S. Rogers, Trans. Roy. Soc. S. Austral. 62:13 (1938)—

Type: Toodyay, *Mrs. and Miss Dedman*, Nov. 11, 1934—holo.:AD.

This only differs from the var. *fuscolutea* in having the perianth more uniformly golden-brown and the column fringe a bright orange. Rogers' type agrees very well with Lindley's.

T. graminea Lindl., Sketch Veg. Swan Riv. Col. 49 (1840)—

Type: Swan River, *Drummond*—holo.:K-L. See note under *T. nuda* R. Br.

T. ixioideis Sw., K. Veteask. Acad. Handl. 21:228 (1800). Recorded for Western Australia by *Bentham* (Fl. Austral. 6:318), who reduced *T. campanulata* Lindl. to synonymy. The latter species is now regarded as distinct, and all the western specimens formerly placed under *T. ixioideis* belong to it.

T. longifolia Forst. f., Char. Gen. 98, t.49 (1776). Recorded for Western Australia by *Bentham* (Fl. Austral. 6:320), but at present not thought to occur here. See note under *T. nuda* R. Br.

T. mackibbinii F. Muell., Chem. & Drugg. Lond. Austral. Suppl. 42:44 (1881). Listed by *Mueller* (Syst. Cens. Austral. Pl. 112) but probably in error for one of the forms of *T. spiralis* (Lindl.) F. Muell.

T. macmillanii F. Muell., Fragm. 5:93 (1865)—

Type: In locis graminosis sinui Port Phillip vicinis e.g. prope montes Eliza et Martha, *McMillan*—holo.:MEL.

T. macrophylla Lindl., Sketch Veg. Swan Riv. Col. 49 (1840)—

Type: Swan River, *Drummond*—holo.:K-L. See note under *T. nuda* R. Br.

T. matthewsii Cheeseman, Trans. N.Z. Inst. 43:177 (1911)—

Type: Between Lake Tongong and the coast, Mongonui County, N.Z., *R. H. and H. B. Matthews*, 1909.

Although the type has not been examined, a collection from New Zealand—Kaitaia, *H. B. Matthews*, Sept. 13, 1914—agrees very well with one from Western Australia—42-43 mile pegs, Brookton Highway, George 1514,

Sept. 10, 1960. The specimens figured by Nicholls, *Orchids of Australia* 1952 t.45, 1969 t.46, are much more deeply coloured and have smaller column lobes than the western and New Zealand specimens. This taxon belongs to the *Thelymitra spiralis* complex and requires further study.

T. mucida R. Fitzg., Gard. Chron. 1:495 (1882)—

Type: Western Australia, *Fitzgerald*. In Austral. Orch. 2, 2, Fitzgerald cites "Wilson Inlet". At BM there is a sheet labelled "Wilsons Inlet, Sept.", in Fitzgerald's hand, which may be taken as the lectotype. There is an isotype at NSW.

T. nuda R. Br., Prod. 314 (1810)—

Type: Port Dalrymple, Tas., *Brown*—holo.:BM, iso.:E, K. There is a complex of forms requiring further study which include *T. nuda*, *T. pauciflora*, *T. graminea* and *T. macrophylla* as well as a number of names applied to eastern Australian forms. *T. longifolia* Forst. f. (1776) is the oldest name available, but the type is from New Zealand and further work is required to ascertain whether this form occurs in Australia.

T. pardalina F. Muell., Fragm. 5:94 (1865)

= *T. villosa* Lindl.

T. pauciflora R. Br., Prod. 314 (1810)—

Type: Port Jackson, *Brown*, 1803—holo.:BM, iso.:E. See note under *T. nuda* R. Br.

T. porphyrosticta F. Muell., Fragm. 5:97 (1865)

= *T. variegata* (Lindl.) F. Muell.

T. psammophila C. Andrews, Journ. W. Austral. Nat. Hist. Soc. 2, 2:57 (1905)—

Type: Near Upper Kalgan River and Stirling Range, *Andrews*, Oct. 1903—holo.:PERTH, iso.:PERTH, NSW.

T. rubra R. Fitzg., Gard. Chron. 1:495 (1882). Listed for Western Australia by Rogers in Black, Fl. S. Austral. (2nd Ed.) 216 (1943), but western specimens are now referred to *T. carnea* R. Br.

T. sargentii R. S. Rogers, Trans. Roy. Soc. S. Austral. 54:41 (1930)—

Types: Bruce Rock, *O. H. Sargent*, Oct. 1929—lecto.:AD; Bencubbin, *R. E. Edmondson*, Oct. 1929—not seen; Dalwallinu, *B. T. Goadby*, Oct. 1929—not seen.

T. spiralis (Lindl.) F. Muell., Fragm. 5:98 (1865)—

Macdonaldia spiralis Lindl., Sketch Veg. Swan Riv. Col. 50 (1840).

var. *spiralis*—

Type: Swan River, *Drummond*—holo.:K-L.—

T. spiralis (Lindl.) F. Muell. var. *pulchella* W. H. Nicholls Vict. Nat. 66:56 (1949)—

Type: Near Bolgart, *Mrs. R. Erickson*—holo.:not seen. Nicholls apparently did not see Lindley's type and was mistaken in assuming another form to be the typical one.

Rogers, in Trans. Roy. Soc. S. Austral. 54:43 (1930), also published the combination *T. spiralis*, apparently unaware that Mueller had already done so.

var. *pallida* W. H. Nicholls, Vict. Nat. 66:55 (1949)—

Type: Yarloop, *Mrs. E. Scouler*—holo.:MEL.

var. *pulchella* W. H. Nicholls, Vict. Nat. 66:56 (1949)

= *T. spiralis* var. *spiralis*.

- var. **punctata** W. H. Nicholls, Vict. Nat. 66:55 (1949)—
Type: Yarloop, Mrs. E. Scouler—not seen.
- var. **scoulerae** W. H. Nicholls, Vict. Nat. 66:55 (1949)—
Type: Yarloop, Mrs. E. Scouler, Sept.-Oct. 1946—holo.:MEL.
- T. stellata* Lindl., Sketch Veg. Swan Riv. Col. 49 (1840)
= *T. fuscolutea* R. Br. var. **stellata** (Lindl.) A. S. George.
- T. tigrina* R. Br., Prod. 315 (1810)—
Type: King George Sound, R. Brown, Dec. 1801—holo.:BM.
- T. variegata* (Lindl.) F. Muell., Fragm. 5:98 (1865)—
Macdonaldia variegata Lindl., Sketch Veg. Swan Riv. Col. 50 (1840)—
Type: Swan River, Drummond—holo.:K-L, iso.:K.
Bentham published the same combination in Fl. Austral. 6:323 (1873),
apparently unaware that Mueller had already done so.
Thelymitra porphyrosticta F. Muell., Fragm. 5:97 (1865)—
Type: Kalgan River, Maxwell—iso.:K.
- T. villosa* Lindl., Sketch Veg. Swan Riv. Col. 59 (1840)—mis-spelt *villosa* by
typographical error.—
Type: Swan River, Drummond—holo.:K-L, iso.:K.—
T. pardalina F. Muell., Fragm. 5:94 (1865)—
Types: Sandy soil, Esperance Bay and Cape le Grand, Maxwell—
lecto.:MEL; Fitzgerald Ranges, Maxwell—syn.:MEL.

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Taxonomic notes on the family Rutaceae, principally of Western Australia

By P. G. Wilson

Abstract

Taxonomic and nomenclatural notes are made on the Rutaceae of Western Australia. A new monotypic genus, *Rhadinothamnus*, is created for the species previously known as *Nematolepis euphemiae* F. Muell. The genus *Drummondia* is recognised as being distinct from *Philotheca* and the necessary new combinations are made. The name *Urocarpus* is found to antedate its synonym *Asterolasia* and new combinations have been made for the Western Australian and South Australian species. One new series is described in the genus *Boronia*. Fourteen new specific or infraspecific taxa are described in the genera *Diplolaena*, *Boronia*, *Eriostemon*, and *Drummondia*. Thirteen new specific or infraspecific combinations are made in the genera *Rhadinothamnus*, *Boronia*, *Drummondia*, and *Urocarpus*. Lectotypes have been chosen for some of the names involved.

Introduction

This paper has been prepared in order to avoid the publication of new names or new combinations in the 'Rutaceae' portion of a projected 'Flora of Western Australia'. The notes are intentionally brief since much of the data will be repeated, or elaborated on, in the 'Flora' itself.

Some of the taxonomic decisions have a bearing on the nomenclature of plants found in the Eastern States. However, name changes have generally been confined to those taxa which occur in Western Australia, as it is with these that the present study has been mainly concerned.

RUTACEAE

Tribe Boronieae

Rhadinothamnus P. G. Wilson gen. nov.

(rhadinós = slender, thamnós = shrub)

Fruticulus omnibus partibus argenteo-lepidotus. Folia alterna simplicia. Flores axillares, solitarii, breviter pedicellati, bibracteolati, pentameri. Calyx lobatus extus lepidotus. Petala libera, valvata, extus lepidota. Stamina 10, libera; filamentum ligula brevi, villosa, supra basin inserta; antherae versatiles, breviter apiculatae; pollinis granum orbiculatum, tetra-colporatum. Discus integer. Carpella 5, libera, placentione ut in *Boronia*; stylus tenuis infra apices carpellorum insertus; stigma parvum. Fructus ut in *Boronia*. Semen anguste reniforme; testa externa tenuis, interna (sclerotesta) laevis; hilum ellipticum, filo cartilagineo circumcinctum.

Type: *R. euphemiae* (F. Muell.) P. G. Wilson.

Undershrub \pm covered with a silvery lepidote indumentum. Leaves small, alternate, simple. Flowers, solitary, axillary, shortly pedicellate, bibracteolate, pentamerous. Calyx lobed, lepidote outside. Petals free, valvate, lepidote outside. Stamens 10, free; filaments with a short villous ligule above the base; anthers versatile, shortly apiculate, dehiscence introrse; pollen orbicular, tetra-colporate; carpels free but compact, placentation as in *Boronia*; style slender, inserted below the apex of the carpels, stigma small. Seed narrow-reniform, outer testa thin, inner (sclerotesta) smooth, hilum elliptic surrounded by a narrow cartilaginous rim, raphe minute, chalaza towards base on adaxial margin.

Only species:

R. euphemiae (F. Muell.) P. G. Wilson comb. nov.

Nematolepis euphemiae F. Muell., Fragm. 3:149 t. 25 (Apr. 1863).—

Phebalium euphemiae (F. Muell.) C. A. Gardn., Enum. Pl. Austral. Occid. 70 (1931).—*Type*: Near Cape Arid, Maxwell (iso. K, photo seen).

P. baxteri Benth., Fl. Austral. 1:345 (30 May 1863).—*N. baxteri* (Benth.) Engler in Engler et Prantl, Nat. Pflanzenfam. 3/4:145 (1896).—*Type*: W. Australia, south coast, Baxter (holo.:K, photo seen).

Distribution: Found near the south coast of Western Australia from the Eyre Range east to Mt. Ragged.

This species was placed in the genus *Nematolepis* by Mueller because it has ligulate stamens and because he thought (incorrectly) that the petals were united. The seed, anther, and other floral characters link it with *Phebalium* sect. *Gonioclados*—which section includes *P. rude* and *P. anceps*. It is also closely related to the genus *Chorilaena*. All these taxa have the hilum surrounded by a ligament-like border, a character not found elsewhere in the tribe Boronieae. *Rhadinotamnus* is unique in the family Rutaceae in having sub-orbicular tetra-colporate pollen grains, whereas in all other genera they are ellipsoidal and tricolporate.

DIPLOLAENA R. Br.

Diplolaena ferruginea P. G. Wilson sp. nov.

Folia late elliptica ca 2 x 1 cm, supra levia, glanduloso-punctata, glabra vel glabrescentia, subtus pallida velutina. Capitula ca. 2 cm lata; bractae ferrugineo-tomentosae, externae anguste-triangulares, ca. 12 mm longae, internae lineari-acuminatae; petala bracteis paulo breviora, linearia, tomento denso, pallido-ferrugineo.

Type: C. A. Gardner 8459, shrub 2 ft., styles crimson; eastern gullies, Mt. Lesueur, 16.x. 1946 (holo.:PERTH, iso.:K).

Spreading shrub to 50 cm high. Leaves broadly elliptic, ca. 2 x 1 cm; upper surface smooth, glandular-punctate, glabrous or glabrescent; lower surface cream to ferruginous velutinous. Flower heads ca. 2 cm wide; outer bracts narrow-triangular, ca. 12 mm long, ferruginous-tomentose; inner bracts linear-acuminate; petals linear, slightly shorter than outer bracts, with a dense, pale ferruginous tomentum.

Distribution: Western Australia, near Jurien Bay on the west coast.

Cockleshell Gully, C. A. Gardner, 8429; 15 mi NW of Badgingarra, spreading shrub to 50 cm, on laterite slope, A. S. George 6764.

In foliage this species resembles *D. dampieri* and *D. grandiflora*. It differs markedly from these in having involucre bracts which are narrowly triangular and petals which are densely ferruginous-tomentose.

Diplolaena microcephala Bartl. var. *velutina* P. G. Wilson var. nov.

Folia anguste oblongo-obcuneata, dense velutina, ca. 15 x 3 mm, margine leviter recurvo. Involucri bractae externae dense ferrugineo-velutinae, ca. 6 mm longae; stamina bracteis internis paulo longiora.

Type: T. E. H. Aplin 509, 2 mi N of Wyalkatchem, 30.vi. 1959 (holo.:PERTH, iso.:K, MEL).

Leaves narrowly oblong-obcuneate with a thick velutinous indumentum, ca. 15 x 3 mm, margin sometimes slightly recurved, apex rounded, base narrow-cuneate grading into a short petiole. Outer involucre bracts densely ferruginous-velutinous, ca. 6 mm long; inner bracts pale brown to ferruginous velutinous. Stamens shortly exceeding inner bracts.

Distribution: Western Australia, in the area between Coorow and Kellerberrin. West of Coorow, W. E. Blackall 3963; Watheroo, flowers pink, erect bushy shrub 2-3 ft., R. D. Royce 4953; Wongan Hills, C. A. Gardner, 5.ix. 1924; 1 mi E of Moonjin, K. Newbey 1991; Wyalkatchem, B. Rosier, July 1959; Yorkrakine, C. A. Gardner, Aug. 1922; Kellerberrin, A. E. Lankester, Sept. 1897; 15 mi N of Jitarning, K. Newbey 2485.

The distribution of the species *D. microcephala* is from the south coast as far north as the Murchison River. Over this wide area the species exhibits numerous different forms, but for only the most distinct of these does it appear practicable to create infraspecific categories. One of these is for the variety described above. Another is for var. *drummondii* Benth. which is found between Mundaring and Muntadgin; it has thin, flat leaves and very long stamens. In the type form of var. *microcephala* the leaves are broadly elliptic to obovoid, ca. 2 cm long, and densely tomentose beneath.

BORONIA Sm.

Sect. *Heterandrae* (Benth.) Engler

Boronia clavata P. G. Wilson sp. nov.

Ramuli puberuli. Folia pinnata, 3-7 foliolata, glabra vel glabrescentia; articuli rhachidis ca. 3 mm longi; foliola linearia vel linearia-obcuneata, obtusa, 7-15 mm longa. Flores solitarii, axillares; pedicelli anguste-turbinati, ca. 3 mm longi, bibracteolati. Sepala ovata vel anguste deltoidea, 2-3 mm longa, subapicaliter apiculata, puberula. Petala imbricata, obovata, ca. 8 mm longa, subapicaliter apiculata, glabra, pallide flavo-viridia. Stamina dimorpha, basi pilosa; filamenta sepalina crassa, clavata, ca. 2.5 mm longa; filamenta petalina attenuata, ca. 1.8 mm longa, apice inflexa, verrucosa; antherae ovatae, acutae, ca. 1.2 mm longae, antisepalinis sterilibus. Discus breviter columnaris, glaber. Ovarium sparse pilosum; stylus et stigma magnum, clavatum, longitudinaliter sulcatum, ca. 4 mm longum, glabrum.

Type: *K. Newbey* 2876, Bremer River ca. 10 mi from mouth, 15.ix. 1969 (holo.:PERTH, iso.:K, MEL).

Subshrub 1-1.5 (2) m high. Branchlets slender, puberulous. Leaves sessile, pinnate, 3-7 foliolate, glabrous or glabrescent; rhachis articles linear, ca. 3 mm long; leaflets linear to linear-obcuneate, obtuse, 10-20 mm long. Flowers erect, solitary, axillary, pedicels narrowly turbinate, ca. 3 mm long, medially bibracteolate (or with two pairs of bracteoles, the lower then \pm compound), minutely puberulous. Sepals ovate to narrowly triangular, 2-3 mm long, fleshy with scarious margins, subapically apiculate, puberulous. Petals imbricate, obovate, ca. 8 mm long, subapically apiculate, glabrous or glabrescent, pale yellow-green. Stamens dimorphic, pilose near base; sepaline filaments thick, clavate ca. 2.5 mm long; petaline filaments terete, attenuate and ca. 1.8 mm long, apex verrucose and inflexed; anthers ovate, acute, ca. 1.2 mm long, the antisepalous sterile or almost so. Disc fleshy, shortly columnar, glabrous. Ovary sparsely pilose; style and stigma massive, clavately columnar and longitudinally grooved, ca. 4 mm long, glabrous. Fruit shortly stipitate, cocci ca. 4 mm long with rounded apices.

Distribution: Western Australia, south west region near Bremer River.

Gairdner River, *K. Newbey* 2883 (PERTH); Bremer River, *A. Gray* (PERTH).

This species appears to be restricted in its distribution to a small area near the south coast of Western Australia. It is peculiar in that the ovary is raised on a gynandrophore, covered by a fleshy disc to which the stamens are laterally attached. The antisepalous anthers are similar in size and shape to the antipetalous but are sterile (or sometimes a few pollen grains are present).

Mr. K. Newbey has provided the following notes on the living plant from his personal observations:

"Upright to spreading slightly open shrub usually about 4 feet high but may reach 7 feet. Confined almost entirely to narrow alluvial floodflats which are 3 to 6 feet above the usual river level."

Boronia octandra P. G. Wilson sp. nov.

Fruticulus ca. 0-3 m altus; ramuli teretes, puberuli. Folia subsessilia, ternata, glabra, foliolis teretiusculis, ca. 5 mm longis apicem versus incrassatis. Flores axillares, solitarii; pedicellus cernuus, ca. 2 mm longus, apice incrassato. Sepala ovata ca. 3 mm longa glabra vel glabriuscula; petala late elliptica, ca. 8 mm longa, glabriuscula. Stamina omnia fertilia;

filamenta incurva, pilosula, sepalinis teretiusculis, ca. 2 mm longis, globulo magno verrucoso terminatis, petalinis brevioribus, teretiusculis, ca. 1.2 mm longis; antherae \pm aequales, ca. 0.8 mm longae, breviter apiculatae. Discus puberulus, albus, in massas 4 pulviniformes petalinas divisus. Ovarium humile, dense pilosulum; stigma sessile quadrilobum, ca. 6 mm latum, album.

Type: P. G. Wilson 7108, 28 km W of Ravensthorpe and 12 km N of Ravensthorpe-Ongerup Road, 14.vii. 1968 (holo.:PERTH, iso.:K, MEL).

Undershrub ca. 0.3 m high; branchlets minutely puberulous in two opposite lines. Leaves subsessile, ternate, glabrous; leaflets subterete to subclavate, ca. 5 mm long. Flowers axillary, solitary, pendulous. Pedicel turbinate, ca. 2 mm long, conspicuously bibracteolate. Sepals ovate, ca. 3 mm long, glabrescent. Petals broadly elliptic, ca. 8 mm long, glabrescent, greenish-cream to reddish-brown. Stamens all fertile; filaments incurved, pilosulose, the antisepalous sub-terete, ca. 2 mm long, with a large, abaxial muricate swelling at the apex, the antipetalous shorter, sub-terete, ca. 1.2 mm long, with no apical swelling; anthers cordate, ca. 0.8 mm long, shortly white-apiculate. Disc puberulous to glabrous, pale green, divided into four antipetalous cushion-shaped masses. Ovary densely pubescent, equal to disc in height; stigma sessile, hemispherical ca. 0.6 mm wide, with four rounded lobes, papillose, pale green.

Distribution: Western Australia, south-west region, from Gnowangerup east to the West River.

Gnowangerup, C. A. Gardner 2094; 10 mi N of Borden, Mr. Janes, 10.ix. 1960; 15 mi W of Ongerup, K. Newbey 352; 3 mi N of Ongerup, K. Newbey 2443, 2444; 55 km N of Bremer Bay, P. G. Wilson 5402; 4 mi E of West River, F. Lullfitz 5399.

Boronia octandra has externally an appearance similar to *B. crassifolia*. It differs from that species in having almost terete leaflets, large sepaline stamens which have a massive apical swelling, a divided disc, and a small stigma. It also has the anthers consistently similar and fertile (a character approached by some forms of *B. crassifolia*). A divided disc is found in the two heterandrous species *B. tetrandra* and *B. purdieana*, but in these the disc masses are opposite to the sepals whereas in *B. octandra* they are alternate to them.

***Boronia* sect. *Cyanothamnus* (Lindl.) F. Muell.**

***Boronia coerulescens* F. Muell. subsp. *spicata* P. G. Wilson subsp. nov.**

Ramuli erecti, dense pilosuli. Folia erecta vel leviter divaricata, anguste-oblonga usque anguste-cuneata vel elliptica, integra, 5–10 mm longa, obtusa, pilosula, supra concava. Flores in racemo spiciformi folioso aggregati. Pedicelli ca. 2 mm longi, pilosuli, bracteolis parvis basalibus ornati. Sepala anguste-ovata, ca. 4 mm longa, prominenter glanduloso-punctata, pilosula. Ovarium pilosulum.

Type: J. W. Green 1500, 2 mi S of Wubin, erect shrub 50 cm high, petals white tinged blue on dorsal side, yellow sand, 22.viii. 1957 (holo.:PERTH).

Branches erect, densely pilosulose. Leaves erect or slightly spreading, narrow-oblong to narrow-cuneate or elliptic, entire, 5–10 mm long, obtuse, pilosulose, upper surface concave. Flowers in dense leafy, spike-like racemes. Pedicels ca. 2 mm long, pilosulose, with a pair of small basal bracteoles. Sepals narrow ovate, ca. 4 mm long, prominently glandular punctate, pilosulose. Ovary pilosulose.

Distribution: Western Australia, between Wubin and Muntadgin.

6 mi S of Wubin, T. E. H. Aplin 565; Between Mollerin and Koorda, W. E. Blackall 3452; Muntadgin, E. T. Bailey 727.

***Boronia coerulescens* F. Muell. subsp. *spinescens* (Benth.) P. G. Wilson comb. et stat. nov.**

B. spinescens Benth., Fl. Austral. 1:319 (1863).—*Type:* “Drummond 78” (holo. K “no. 87”, photo seen).

The species *B. coerulescens* is extremely variable in Western Australia. To the south and south-east of Lake Grace is found a form of subsp. *coerulescens* which is almost identical to the form found in South Australia and Victoria. North-west of Lake Grace, as far as the Murchison River, are found subsp. *spinescens* and subsp. *spicata*. The former is distinguished, most obviously, by its spike-like inflorescence and the latter by its spreading branchlets which are frequently pungent. There is however, no sharp separation between any of them and their areas of distribution overlap.

Boronia ramosa (Lindl.) Benth. subsp. **anethifolia** (Bartl.) P. G. Wilson stat. nov.

Cyanothamnus anethifolius Bartl. in Lehm., Pl. Preiss. 1:170 (1844).—

B. ramosa var. *anethifolia* (Bartl.) Benth., Fl. Austral. 1:320 (1863).—

Type: "prope Spitesbrook ad fluvium Canning", Preiss 2035.

C. tridactylites Bartl., l.c. 2:227 (1848).—Type: Preiss 2628.

B. subcoerulea F. Muell., Fragm. 2:100 (1860).—Type: Murchison R., Oldfield; Champion Bay, Walcott.

This taxon requires recognition as a subspecies. It has pedicels shorter than the leaves, and anthers which are minutely white-apiculate. In the typical subspecies the pedicels are longer than the leaves and the anthers are prominently apiculate.

Boronia sect. **Valvatae** (Benth.) Engler

Boronia ternata Endl. var. **foliosa** (S. Moore) P. G. Wilson comb. et stat. nov.

B. foliosa S. Moore, J. Linn. Soc. Bot. 45:165 (1920).—Type: Bruce Rock Stoward 334 (isosyn. MEL).

B. ternata Engl. var. **elongata** P. G. Wilson var. nov.

Folia simplicia, oblonga usque obovata, 5–10 mm longa, glabra. Pedicelli graciles, 4–10 mm longi. Sepala ca. 2 mm longa; petala ca. 7 mm longa, erubescencia.

Type: P. G. Wilson 6932, N side of Mt. Short which is 14 km NNW of Ravensthorpe, straggly undershrub 1.3 m high, flower pink, 8. viii. 1968 (holo.:PERTH, iso.:B, K, MEL).

Leaves simple, oblong to obovate, 5–10 mm long, glabrous. Pedicels slender, 4–10 mm long. Sepals ca. 2 mm long; petals ca. 7 mm long, pink.

Distribution: Western Australia, near Ravensthorpe.

1 mi E of Elverdton Mine, Ravensthorpe, K. Newbey 2602; Ravensthorpe Range, A. S. George 1620.

The species of *Boronia* in the sect. *Valvatae* (apart from *B. alata*) appear to be closely related and to exhibit a multiplicity of different forms. Some of these forms, such as the one described above, warrant recognition, but it is not possible to demarcate clearly the limits of the various taxa.

Boronia revoluta P. G. Wilson, sp. nov.

Fruticulus 50–80 cm altus. Rami sparse pilosi. Folia parum congesta ternata; petiolus ca. 1.5 mm longus; foliola valde revoluta subteretia 4–8 mm longa glabrescentia. Flores axillares solitarii; pedicellus 3–5 mm longus glaber ruber, apice turbinato, bracteolis 2 vel 4 anguste triangularibus ca. 2.5 mm longis supra basin insertis. Sepala ovata acuminata ca. 3 mm longa rubra sparsissime stellato-pilosa. Petala valvata ovata ca. 7 mm longa pallide rosea, extra stellato-pilosa, intra praeter apicem versus pilosum glabra, costa prominenti. Stamina 2.5–3 mm longa; filamenta subteretia apice aliquantum tumido, sparse stellato-hirsuta; anthera cordata ca. 1 mm longa, apice rotundato cum acumine recurvo ca. 0.2 mm longo. Discus integer pallido ruber glaber. Ovarium hemisphaericum, glabrum; stylus brevis teres ca. 0.2 mm longus glaber; stigma capitata.

Type: K. Newbey 2388, South Ironcap (ca. 45 km NNE of Lake King township), Lat. 32°42'S, Long. 119°40'E; rocky sand, plant 18 in–30 in, 4.ix.1970 (holo.:PERTH, iso.:K).

Subshrub 50–80 cm high. Branches sparsely pilose. Leaves somewhat congested, ternate; petiole ca 1.5 mm long; leaflets strongly revolute and subterete, 4–8 mm long, glabrescent on upper (outer) surface, stellate pilose below (within). Flowers solitary, axillary; pedicel glabrous, red, turbinate beneath

calyx; bracteoles 2 or 4, narrowly triangular, ca 2.5 mm long. Sepals ovate-acuminate, ca 3 mm long, very sparsely stellate-pilose, red. Petals valvate, ovate, ca 7 mm long (enlarging slightly in fruit), acute, loosely stellate-pilose outside, glabrous within except near apex, pale pink, midrib prominent. Stamens 2.5-3 mm long (the antisepalous slightly longer than the antipetalous); filaments subterete, somewhat swollen and verrucose at apex, sparsely stellate-hirsute; anthers cordate, ca. 1 mm long, apex rounded with an acuminate and recurved apiculum ca $\frac{1}{4}$ length of loculi; pollen orange. Disc entire, pale red, glabrous. Ovary hemispherical, glabrous; style short, terete, ca. 0.2 mm long, glabrous; stigma capitate. Seed reniform, 3.5 mm long; outer testa membranous, dull; placental endocarp persistent, thick; raphe insignificant; chalaza near base on adaxial margin.

Distribution: Western Australia, between Lake King and the Johnston Lakes. Hatters Hill (40 km NE of Lake King township), Oct. 1929, *H. Steedman* 32 (in fruit).

This plant is similar to *B. ericifolia*, a species found much farther north between Moora and the Wongan Hills. *B. revoluta* differs most noticeably in having much longer hairs on stem and petals, a petiolate (not sessile) leaf, and larger flowers. Since the collections seen have both been made on ironstone hills it would appear probable that *B. revoluta* is restricted to this type of habitat. *B. ericifolia* grows on yellow sand or loam.

Boronia sect. Boronia

***Boronia oxyantha* Turcz. var. *brevicalyx* (Benth.) P. G. Wilson comb. nov.**

B. lanuginosa Endl. var. *brevicalyx* Benth., Fl. Austral. 1:317 (1863).—

Type: "Phillips River, Herb. Mueller", (iso.:MEL).

The type of *Boronia lanuginosa* was thought by Endlicher to have come from King George Sound on the south-west coast of Western Australia. Benth., who had not seen the type specimen, assumed that the short original description applied to a *Boronia* which had been collected by Robert Brown in the same area. Reference to the type of *B. lanuginosa* (*Ferd. Bauer*, Naturhistorisches Museum, Wien) shows that it belongs in fact to a species found along the north coast of Australia and which received the later name of *B. artemisiifolia* F. Muell. The correct name for the species Benth. had in mind, which came from the south coast, is *B. stricta* Bartl. Benth.'s variety "*brevicalyx*" is not, however, closely related to this species nor to *B. lanuginosa*, but to *B. oxyantha*. Although conspecific with the latter it differs sufficiently to warrant varietal recognition; in var. *oxyantha* the branches are puberulous and the sepals ca. 5 mm long and acuminate, while in var. *brevicalyx* the branches are hirtellous and the sepals are acute and ca. 2 mm long. The variability within var. *brevicalyx* suggests that it may grade into the typical variety but for this to be confirmed further collecting is necessary in the Ravensthorpe-Fitzgerald R. area where both are found.

***Boronia capitata* Benth. subsp. *clavata* P. G. Wilson subsp. nov.**

Folia carnosae saepe sub-clavata, basin versus sparse ciliata aliter glabra. Bracteolae naviculiformes, latae. Sepala manifeste ciliata, aliter glabra, apice incrassata; petala glabra. *Type:* 17.5 mi W of Lake Grace, *A. S. George* 348, 3.ix. 1959 (holo.:PERTH, iso.:K).

Leaves fleshy, often sub-clavate, sparsely ciliate towards base, otherwise glabrous. Bracteoles naviculiform, broad. Sepals prominently ciliate otherwise glabrous, apex thickened. Petals glabrous.

Distribution: Western Australia, south-west. Corrigin-Nyabing district.

1 mi W of Corrigin, *K. Newbey* 2610; Kulin, *A. Ashby* 43; Tarin Rock, *C. A. Gardner* 1745; 2 mi N of Nyabing, *K. Newbey* 439.

Boronia capitata Benth. subsp. **gracilis** P. G. Wilson subsp. nov.

Ramuli graciles, in lineis decurrentibus pilosi. Folia gracilia, sub-tercia, supra concava, basin versus sparse ciliata, aliter glabra. Flores in capitulum parvum aggregati; sepala anguste triangularia, glabra, eciliata, rubra, minute apiculata; petala glabra.

Type: *R. D. Royce* 4571, Black Swamp, Metricup, 3.x. 1953 (holo.:PERTH, iso.:K).

Branches slender, pilose in raised lines decurrent from either side of leaf base. Flowers in small terminal clusters. Sepals narrowly triangular, glabrous, red, eciliate, minutely apiculate. Petals glabrous.

Distribution: Western Australia, south-west. Between Busselton and Margaret River.

Jindong, *R. D. Royce* 4599.

The three subspecies into which *B. capitata* is divided are distinct in appearance and have separate areas of distribution. The typical subspecies is only known from a small area near Pingelly; it differs from the other two in having pubescent leaves and branches, and narrowly triangular pubescent sepals.

Boronia virgata P. G. Wilson sp. nov.

Rami graciles, in statu juvenili sparse puberuli. Folia trifoliolata vel pinnatim 5 (7)—foliolata, ca. 1.5 cm. longa, glabra; petiolus rachisque semiteretes, uterque 3 mm longi; folioli anguste elliptici vel anguste oblongi, 5–10 mm longi, plani vel supra concavi, \pm integri, acuti, coriacei. Flores solitarii axillares; pedicellus gracilis 6–14 mm longus, infra medium breviter bibracteolatus. Sepala anguste triangularia 2–3 mm longa glabra rubra. Petala imbricata, ovata ca. 7 mm longa, intra puberula, extra marginis puberulis aliter glabra, rubra; apex obtusus vel acutus cum apiculo acuminato. Stamina filamenta semiteretia ca. 3 mm longa (antisepalina parum longiora), infra medium sparse ciliata, apice tumido verrucoso; anthera cordata ca. 1 mm longa, minutissime apiculata. Discus glaber integer pallido-ruber. Ovarium hemisphaericum, glabrum; stylus et stigma continuum, anguste clavatum ca. 1 mm longum, in medio hirsutum.

Type: *P. G. Wilson* 10219, ca. 19 mi W of Denmark on road to Walpole; growing in waterlogged soil; loose perennial to 1 m high, flowers pink; 7.x.1970 (holo.:PERTH, iso.:CANB, K, MEL).

Flowers solitary axillary; pedicel slender, 6–14 mm long, glabrous, shortly bibracteolate below the middle. Sepals very narrowly triangular, 2–3 mm long, glabrous, red. Petals ovate, ca. 7 mm long, obtuse to acute with a terminal or subterminal setaceous apiculum, puberulous within and towards margins outside. Stamens erect; filaments semiterete, 3 mm long (the antisepalous slightly longer than the antipetalous), sparsely ciliate in lower half, apex somewhat swollen and verrucose; anther cordate, ca. 1 mm long, very minutely apiculate. Disc glabrous, undivided, pink. Ovary hemispherical, glabrous; style and stigma continuous, narrowly clavate, ca. 1 mm long, hirsute in medial portion. Seed elliptically lenticular, 2–5 mm long; outer testa glossy; hilum along adaxial margin, linear; raphe basal with a thin crustaceous covering.

Distribution: Western Australia, near the south coast between Denmark and Nornalup.

5 mi W of Denmark near coast, 9.iv.1965, *W. H. Butler*; 11 mi W of Denmark, grey swampy sand, straggly shrublet 3 ft., 17.ix.1966, *E. M. Strymeour* 1156; 12 mi W of Denmark, roadside swamp, shrub 4 ft., 12.x.1962, *A. R. Fairall* 629; 4 mi E of Nornalup, 4.ix.1947, *J. H. Willis* (MEL).

While the collections of *Boronia virgata* have all been made along or to the south of the Denmark-Nornalup road it presumably occurs also some distance to the north and may once have formed part of a cline involving *B. pulchella*, a species now practically restricted to the Stirling Range. It differs from the latter in having usually fewer leaflets, narrowly attenuate calyx lobes, a glabrous ovary and a longer style.

Boronia coriacea P. G. Wilson, sp. nov.

Fruticulus ericoideus ca. 50 cm altus. Ramuli leviter glanduloso-verrucosi. Folia ternato-trifoliolata vel pinnatim 5-foliolata, ca. 1.5 cm longa, coriacea, glabra; foliola anguste obcuneata, ca. 12 x 1.5 mm, apice obtusa vel rotundata. Flores glabri, in cymis brevibus termin-

alibus aggregati. Sepala imbricata, late ovata vel semi-orbicularia, ca. 1 mm longa, rosea, apice obtusa, indistincte subterminaliter apiculata. Stamina erecta; filamenta clavata, aliquantum verrucosa; antherae cordatae acute apiculatae, ca. 1 mm longae. Discus planus, simplex. Ovarium hemisphericum; stylus breviter cylindricus, ca. 1 mm longus; stigma subcapitatum, 4-sulcatum.

Type: About 20 mi S of Mt. Ragged on road to Israelite Bay, growing on limestone rubble, plant 50 cm high, petals pink, 3.x.1970, P. G. Wilson 10083 (holo.:PERTH, iso.:K).

Small cricoid shrub ca. 50 cm high. Branchlets faintly glandular-verrucose, minutely puberulous in two opposite sunken grooves, otherwise glabrous. Leaves ternately trifoliolate or pinnately 5-foliolate, ca. 1–5 cm long, coriaceous, glandular-verrucose (when dry), glabrous; petiole semiterete. 2–4 mm long; leaflets narrowly obcuneate, ca. 12 x 1–5 mm, apex obtuse to rounded. Flowers completely glabrous, in small terminal clusters not exceeding the leaves. Pedicel ca. 3 mm long, glabrescent, medially minutely bibracteolate. Sepals imbricate, broadly ovate to semi-orbicular, ca. 1 mm long, thick. Petals imbricate, broadly ovate, ca. 5 mm long, pink; apex obtuse, indistinctly subterminally apiculate. Stamens erect, the antisepalous slightly exceeding the stigma; filaments clavate, somewhat verrucose; anthers cordate, acutely apiculate, ca. 1 mm long. Disc flat, simple. Ovary hemispherical; style shortly cylindrical, ca. 1 mm long; stigma sub-capitate, 4-grooved. Fruit not seen.

This species has only been recorded from the type locality in the south-east of Western Australia. It is found on thin limestone soil both in sand-heath and in mallee vegetation.

Between Mt. Ragged and Israelite Bay, mallee on limestone, 28.x.1967, J. S. Beard 5301 (KINGS PARK, PERTH) .

***Boronia crenulata* Sm. var. *gracilis* (Benth.) P. G. Wilson comb. nov.**

B. viminea var. *gracilis* Benth., Fl. Austral. 1:325 (1863).—*Type*: Drummond 1848 colln. no. 92 (holo.:K, photo seen).

This taxon is convarietal with *B. viminea* Lindl., *B. tenuifolia* Bartl., and *B. machardiana* F. Muell. It differs from the typical variety most conspicuously in the floral characters: in var. *crenulata* the pedicels are short, often thick, and the sepals ciliate, whereas in var. *gracilis* the pedicels are slender and the sepals eciliate.

***Boronia* sect. *Imbricatae* Engl.**

Engler, Nat. Pflanzenfam. 3/4:136 (1896). *Lectotype*: *B. cymosa* Endl.

This section consists of three series which may be distinguished by the following key:—

Sepals persistent.

Staminal-filament apex not swollen; funicle expanding into an aril in centre of adaxial surface of seed ser. **Imbricatae**

Staminal-filament apex swollen; funicle slender, no aril present ser. **Ovatae**
Sepals falling in fruit; funicle slender ser. **Pedunculatae**

Series *Imbricatae*

Only species: *B. cymosa* Endl.

Series *Ovatae* P. G. Wilson ser. nov.

Sepala persistentia. Filamenta staminum \pm teretia, ciliata, apice gibbosa, muricata; antherae albo-apiculatae; stylus cylindricus (vel basim versus tumidus). Semen ellipsoidialiter lenticulare; endocarpus placentae tenuis, caducus; hilum parvum, ellipticum ad centrum marginis adaxialis; testa exterior membranacea laevis.

Type: *B. ovata* Lindl.

Sepals persistent. Staminal filaments \pm terete, ciliate with a swollen muricate apex; anthers white-apiculate, affixed to sub-apical portion of filament. Seed ellipsoidally lenticular; placental endocarp thin, caducous; hilum small, elliptical; outer testa membranous, smooth.

The only other species in this series is *B. scabra* Lindl.

Series *Pedunculatae* Benth.

Benth., Fl. Austral. 1:326 (1863). *Lectotype*: *B. spatulata* Lindl.

Also included in this series are *B. juncea* Bartl., *B. denticulata* Sm., *B. fastigiata* Bartl., and *B. dichotoma* Lindl. The species in this series are exceptional in the genus *Boronia* in having flowers in which the sepals are caducous.

ERIOSTEMON

Sect. *Nigrostipulae* P. G. Wilson

Eriostemon cymbiformis P. G. Wilson sp. nov.

Fruticulus ca. 50 cm altus, glaucescens. Rami glabri, epidermide integra (foliis nec decurrentibus). Folia crassa, anguste elliptica, 6–10 mm longa, supra concava, glabra. Flores terminales, plerumque solitarii. Pedicellus crassus, obconicus, glaber. Sepala triangularia 1.5–2 mm longa crassa minute ciliata cetero glabra. Petala ovata ca. 6 mm longa alba, extra glabra, intra puberula. Stamina erecta, corolla paulo breviora; filamenta dimidio inferiore linearia et dense lanata, dimidio superiore teretia et dense pilosa; anthera cordata ca. 1 mm longa, minutissime apiculata. Discus angustus, atropurpureus. Ovarium late pyramidale, glabrum; stylus teres ca. 2.5 mm longus pilosus, staminibus paulo brevior; stigma subcapitata.

Type: P. G. Wilson 10176, Fitzgerald River Reserve, ca. 27 km SW of the Jerramungup-Ravensthorpe Rd. along Rabbit Proof Fence, Lat. 34°8'S, Long. 119°18'E, 7.x.1970 (holo.: PERTH, iso.:K)

Subshrub ca. 50 cm high, slightly glaucous, glabrous, without obvious leaf decurrencies. Leaves thick, narrow elliptic, 6–10 mm long, concave above, glandular verrucose below when dry, glabrous; stipules absent. Flowers terminal and usually solitary, surrounded by a few leaves. Pedicel thick, obconical, ca. 1.5 mm long, glabrous, with several small imbricate basal bracteoles. Sepals triangular, 1.5–2 mm long, thick, minutely ciliolate otherwise glabrous. Petals ovate, ca. 6 mm long, glabrous outside and puberulous within, white with reddish brown medial strip outside; apex obtuse, thickened and slightly inflexed. Stamens erect, slightly shorter than petals; filaments linear and densely woolly in lower half, terete and acuminate with pilose hairs in upper half; anthers cordate, ca. 1 mm long, very minutely apiculate; pollen very pale yellow. Disc narrow, dark purple. Ovary broadly pyramidal, glabrous, style terete ca. 2.5 mm long (slightly shorter than the stamens), pilose; stigma subcapitate. Seed not seen.

Distribution: Western Australia, between Bremer Bay and Hopetoun. Known only from the Fitzgerald River Reserve.

Mount Bland (ca. 34°12'S, 119°28'E), growing on sand, spreading shrub 40 cm high, 14.x.1967, K. Newbey 2649.

Eriostemon cymbiformis is closely related to *E. glaber* P. G. Wilson, a species found much further north in the Mullewa-Cowcowing area of Western Australia. It may be distinguished from the latter by the absence of any decurrent bands of tissue on the branches, by the triangular (not rounded) sepals, and by the anthers which are only minutely apiculate.

The specific epithet refers to the leaves which, at least when dry, are somewhat boat-shaped.

DRUMMONDITA Harvey

Harvey, J. Bot. Kew Misc. 7:53 (1855).

Although the name *Drummondita* was placed in synonymy under *Philothea* by Mueller in 1869 (and subsequently by all other botanists) the two genera

are clearly distinct. In *Philotheca* the petals are soft, the stamens are all fertile with versatile anthers, and the carpels have a terminal sterile portion which is produced in fruit as a short beak. In *Drummondita* the petals are glumaceous, only the antipetalous stamens bear anthers (and these are dorsifixed), and the ovary and fruit are rounded at the apex.

The following four species are known:—

1. ***Drummondita ericoides*** Harvey, l.c.

Philotheca ericoides (Harv.) F. Muell., *Fragm.* 7:21 (1869).—*Type*: “Near the summit of the White Peak, a detached hill near Moresby’s Range” (iso.:K, photo seen).

2. ***Drummondita miniata*** (C. A. Gardn.) P. G. Wilson comb. nov.

Philotheca miniata C. A. Gardn., *J. Roy. Soc. W. Aust.* 14:79 (1928).—*Type*: near Cue, C. A. Gardner Jul. 1927; east of Cue, W. D. Campbell June 1902 (syn.:PERTH), (lecto.:July 1927 colln. PERTH).

3. ***Drummondita hassellii*** (F. Muell.) P. G. Wilson comb. nov.

Philotheca hassellii F. Muell., *South. Sci. Rec.* 3:3 (1883).—*Type*: “North-east of Janamonjup”, A. Y. Hassell (holo.:MEL).

This species is very variable in flower and leaf size but one form appears to warrant varietal recognition. The two infraspecific taxa may be recognised by the following key:

Leaves semi-terete to obovoid, 3–12 mm long, smooth	var. <i>hassellii</i>
Leaves slender-terete, ca. 17 mm long, rugulose	var. <i>longifolia</i>

Var. ***longifolia*** P. G. Wilson var. nov.

Folia leviter divaricata, anguste-teretia, ca. 17 (20) x 1 mm, rugulosa (statu sicco), nitida. Flores usque 25 mm longi; petala filamentaque rubra.

Type: C. A. Gardner, 15.vi. 1929, Peak Charles, in granite crevices, 1300 feet alt. (holo.: PERTH, iso.:K).

Leaves somewhat spreading, slender-terete, ca. 17 (20) x 1 mm, rugulose (when dry), glossy. Flowers to 25 mm long, petals and filaments red.

Distribution: Western Australia. Known only from the type locality ca. 40 km W of Dowak, which is between Norseman and Esperance.

4. ***Drummondita calida*** (F. Muell.) P. G. Wilson comb. nov.

Philotheca calida F. Muell., *Fragm.* 7:21 (1869).—*Type*: “In montibus ad flumen Gilbert’s River”, R. Daintree (holo.:MEL).

Distribution: Northern Queensland.

UROCARPUS Drumm. ex Harv.

Urocarpus Drumm. ex Harv., *J. Bot. Kew Misc.* 7:54 (Feb. or Mar. 1855).—*Type*: *U. phebaloides* Drumm. ex Harv.

Asterolasia sect. *Urocarpus* (Harv.) Benth., *Fl. Austral.* 1:362 (1863).

Asterolasia F. Muell., *Trans. Phil. Soc. Vict.* 1:10 (Sept.-Nov. 1855).—

Lectotype (Baillon, 1872): *A. trymaloides* F. Muell.

Pleurandropsis Baill., *Adansonia* 10:305 (1872).—*Type*: *P. phebaloides* (F. Muell.) Baill.

Note: F. Mueller, (1855) in the same paper described two species in the genus *Asterolasia*, *A. trymaloides* and *A. phebaloides*. The latter was removed by Baillon who placed it in his monotypic genus *Pleurandropsis*; thus the former species became the lectotype of *Asterolasia*.

The correct generic name for the Western Australian species is *Urocarpus*, this being the earliest of the three generic synonyms cited above. The species of New South Wales and Victoria could be considered sectionally or generically

distinct for they have a consistently 5-carpellary ovary (as against 2–3 carpellary in the Western Australian species) and, according to Smith-White (1954), differ in chromosome number. The latter was reported for only two species, *Asterolasia correifolia* (A. Juss.) Benth. n = 14 (eastern states) and *Asterolasia pallida* Benth. n = 13 (Western Australia). Morphological characters (other than carpel number) suggest that the Australian taxa are congeneric.

The following species all belong to *Urocarpus* s.str., i.e. they have a carpel number of 2–3. Nomenclature changes for the species found in the eastern states must await a taxonomic study.

1. ***Urocarpus squamuligerus*** (Hook.) P. G. Wilson comb. nov.
Phebalium squamuligerum Hook., Ic. Pl. 8:t727 (1848).—*Eriostemon hookeri* F. Muell., Fragm. 1:104 (1859), based on above.—*Asterolasia squamuligera* (Hook.) Benth., Fl. Austral. 1:352 (1863)—*Type*: Swan River, *Drummond* (holo.:K, photo seen). Western Australia.
2. ***Urocarpus phebalioides*** Drum. ex Harv., l.c. 55.
Eriostemon drummondii F. Muell., Fragm. 1:105 (1859), based on above. *Asterolasia phebalioides* (Harv.) Benth., Fl. Austral. 1:352 (1863) nom. illeg. non F. Muell. (1855).—*A. drummondii* Blackall & Grieve, How to know W. Austral. Wildfl. 256 (1954), nom. inval.—“*Pleurandropsis phebalioides* (Drumm.) Baill.” ex C. A. Gardn. Enum. Pl. Austral. Occ. 70 (1931), non *P. phebalioides* (F. Muell.) Baill. (1872).—*Type*: Mt. Lesueur, *Drummond* 84 (iso.:K, photo seen). Western Australia.
3. ***Urocarpus pallidus*** (Benth.) P. G. Wilson comb. nov.
Asterolasia pallida Benth., Fl. Austral. 1:352 (1863).—*Eriostemon pallidus* (Benth.) F. Muell., Fragm. 7:22 (1869).—*Type*: Swan River, *Drummond* 42 and 112 (syn.:K, photo seen, MEL).
A. dielsii C. A. Gardn., J. Roy. Soc. W. Austral. 19:84 (1933).—*Type*: near Glen Forrest, *C. A. Gardner* 819A (holo.:PERTH). Western Australia.
4. ***Urocarpus grandiflorus*** (Hook.) P. G. Wilson comb. nov.
Phebalium grandiflorum Hook., Ic. Pl. 8:t 724 (1848).—*Eriostemon grandiflorus* (Hook.) F. Muell., Fragm. 1:105 (1859).—*Asterolasia grandiflora* (Hook.) Benth., Fl. Austral. 1:352 (1863).—*Type*: Swan River, *J. Drummond* 1st Coll. n. 12 (holo.:K, photo seen). Western Australia.
5. ***Urocarpus muricatus*** (Black) P. G. Wilson comb. nov.
Asterolasia muricata Black, Trans. Roy. Soc. S. Austral. 36:22 (1912).—*Type*: Nr. Mt. Thisbe, Kangaroo Is., *H. H. Griffith*, Oct. 1908 (holo.:AD). South Australia.

The dates of publication for *Urocarpus* and *Asterolasia* are taken from a manuscript by Dr. N. T. Burbidge. I am grateful to Dr. Burbidge for allowing me to read her paper.

A new species of *Philotheca*, *P. tubiflora*—the first record of the genus, *sensu stricto*, for Western Australia

By A. S. George

PHILOTHECA Rudge
Philotheca tubiflora A. S. George sp. nov.

Frutex 30–60 cm altus, ramosissimus; ramuli et folia juvenes minuter pubescentes, mox glabri. Folia sparsa, conferta, clavata-teretia, 2·5–4 mm longa, breviter petiolata, glandulis oleosis prominentibus, etiam glandulo apiculato fusco; excrescentia stipularia brunnea. Flores terminales vel raro axillares, solitarii, pedicellis brevibus crassis. Bracteae plures, parvae, apiculatae. Lobi calycis 1–1·5 mm longi, late-lanceolati, obtusi, apiculati, marginibus ciliatis, vix imbricatis. Petala 8–12 mm longa, pro 3–5 mm connata ubi cum filamentis staminorum conjuncta, alba vel pallide punicea, anguste, oblongo-elliptica, obtusa, partes liberae ante anthesin imbricatae, deinde fere ad calycem recurvi, intus (etiam extus ad margines) dense pubescentes; tubus intus et extus glaber. Filamenta staminalia cum tubo corollae conjuncta, partes liberae dense hirsutae. Antherae apiculatae. Carpelli glabri; discus obscurus vix lobatus. Stylus crassus, teres, pilosus, primo quam stamina brevior, mox paulo longior. Stigma parvum truncatum. Cocci fructiferi uniseminati, obtusi. Semina reniforma, 2·7 mm longa.

Type: Near Point Kidman, 26 miles ENE of Laverton on White Cliffs road (122°47'E, 28°30'S), on rocky hill with *Callitris huegelii*. A. S. George 4506, 29 June 1963 (holo.:PERTH, iso.: PERTH, CANB, MEL, NSW, K, NY).

A shrub 30–60 cm tall, much-branched; young branchlets and leaves minutely pubescent, but soon glabrous. Leaves scattered, crowded, clavate-terete, 2·5–4 mm long, shortly petiolate, with prominent oil glands and a brown apical gland; stipular excrescences brown. Flowers terminal or rarely axillary, solitary, on short thick pedicels. Bracts several, small, apiculate. Calyx-lobes 1–1·5 mm long, broadly lanceolate, obtuse, apiculate, margins ciliate, slightly imbricate. Petals 8–12 mm long, connate for 3–5 mm and united with the staminal filaments, white or pale pink, narrowly oblong-elliptic, obtuse, the free portions imbricate before anthesis, then recurved almost to the calyx, densely pubescent inside, and outside along the margins; tube glabrous inside and out. Staminal filaments united with corolla tube, the free parts densely hirsute. Anthers apiculate. Carpels glabrous, 3 mm high; disc obscure, slightly lobed. Style thick and terete, pilose, at first shorter than the stamens but later elongating slightly above them. Stigma small, truncate. Fruiting cocci one-seeded, obtuse. Seeds reniform, 2·7 mm long.

Distribution: Western Australia, on the western edge of the Great Victoria Desert near Laverton.

24 miles NE of Laverton on Cosmo Newberry road (near Deebea Rockhole), on low rocky rise with *Callitris* and *Dodonaea*, A. S. George 2832, 23 Aug. 1961 (PERTH); White Cliffs woolshed, 40 miles ENE of Laverton (122°58'E, 28°25'S), along edge of breakaway, A. S. George 4538, 30 June 1963 (PERTH, AD, BRI, RSA).

This species differs from all others principally in the union of the lower parts of the petals and staminal filaments into a tube. The brown apiculate glands of the leaves, bracts and calyx-lobes are also distinctive. It is the only species of the genus in Western Australia, and its occurrence on the edge of the Great Victoria Desert is of much interest. The other species occur in near-coastal situations in New South Wales and Queensland. The Western Australian species formerly included in *Philotheca* are now placed in the genus *Drummondita* Harvey (see P. G. Wilson, *Nuytsia* 1,2:205).

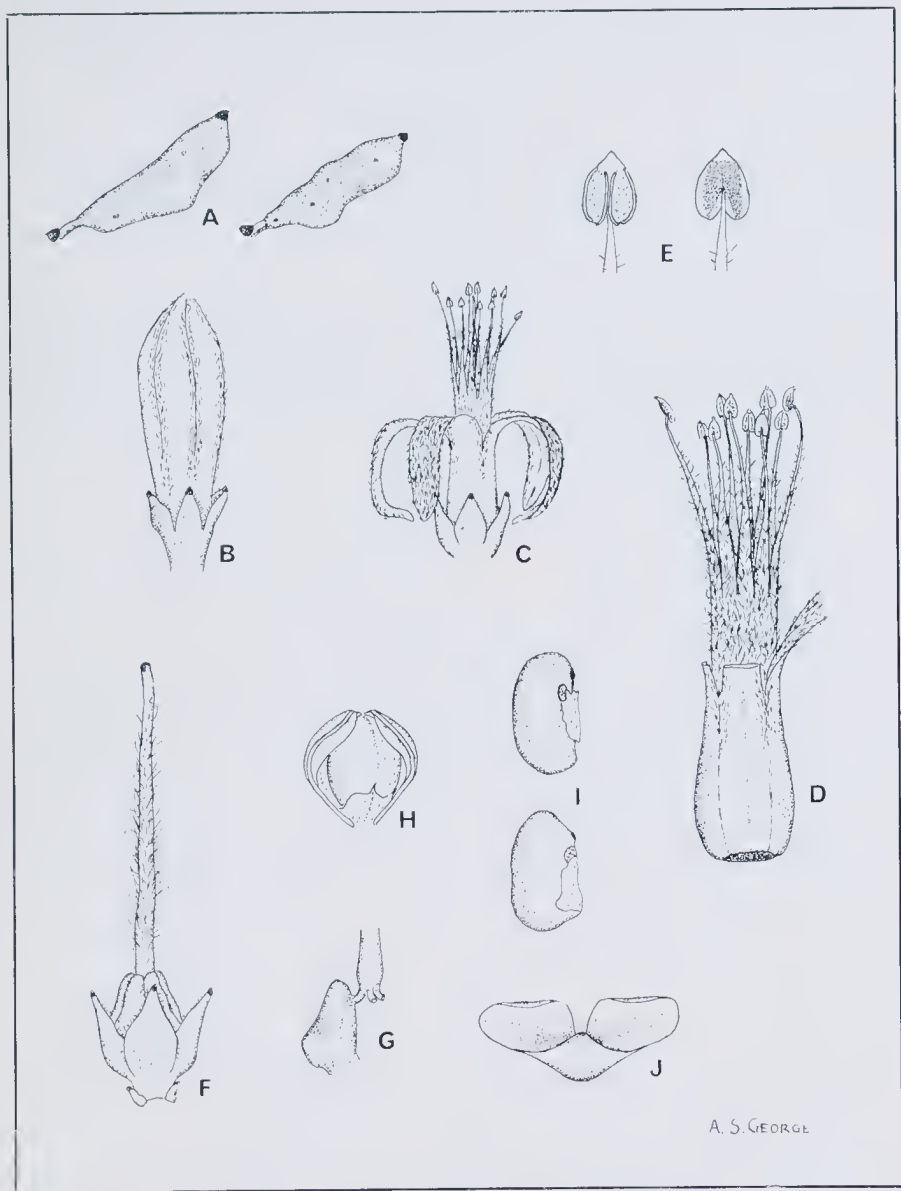


Figure 1—*Philotheca tubiflora* sp. nov. A—Leaves, with stipular excrescences, x10. B—Bud, x5. C—Flower, x 4.5. D—Corolla tube and stamens, x 6. E—Anthers, x 17. F—Bracts, calyx, carpels and style, x 6. G—Attachment of style to carpel. H—Carpel before dehiscence, x 4.5. I—Seeds, with membranous portion of endocarp and abortive ovule attached, x 6. J—Endocarp after dehiscence. A-G from A. S. George 4506; H from George 2832; I, J from George 4538.

Studies in the Genus *Eucalyptus*, Series *Dumosae*

By M. I. H. Brooker *

Abstract

Blakely's Series *Dumosae* is discussed and a hierarchy of characters, viz., stamens, cotyledons, pith glands and seed, is suggested for the definition and subdivision of the group. Seven species are recommended for exclusion and eight for inclusion on these grounds.

Introduction

The species included by Blakely (1934) in his series *Dumosae* are a heterogeneous group. The Series was placed in a Subsection of the Section *Macrantherae* based on anther and filament characters. Thirty-nine taxa were then assigned to a Series (*Dumosae*), the only Series of the Subsection, on the basis of their having more or less in common an assortment of other characters, viz., habit, leaf, bud and fruit morphology.

Classification based on the characters so far mentioned has led to many anomalies. While some species with atypical anthers should be excluded from the *Dumosae*, others should be included on anther characters and on other grounds such as cotyledon and seed morphology and the presence of pith glands. None of the latter three characters is mentioned by Blakely in his description of the *Dumosae*.

The importance of cotyledon morphology in classification was indicated by Pryor (1956, 1962) in reference to *Eucalyptus caesia* and *E. decipiens*. Particular attention has been recently drawn to the significance of cotyledon shape in the *Dumosae* by Carr and Carr (1969). All three authors suggest that cotyledon shape is of fundamental importance in eucalypt systematics and that species with bisected cotyledons should be considered as belonging to an infrageneric taxon based on this character—a scheme foreshadowed by Maiden in his "Division" *Bisectae* (1933). Maiden recognised two other cotyledonary types—reniform and bilobed. Eight species of Maiden's "Division" *Bilobae* from his Series 11 and 12, and one of his "Division" *Bisectae* from Series 11 were included in Blakely's Series *Dumosae* (1934, 1955, 1965). Blakely sometimes referred to cotyledon morphology but did not make it a basis for classification.

There is no comprehensive published work on seed morphology. Maiden (1929) composed a seed classification for about 200 species which he divided among 19 Series. The scheme, which includes five species relevant to the *Dumosae*, is rather obscure and incomplete despite the fact that many more species were known to him at the time. It is surprising that he did not include a description of *E. dumosa* seed as this is one of the two species of the *Dumosae* found in New South Wales and it might be expected that specimens of them were readily available to him. Blakely (1934) gave a slight description of the seed of species in some Series. As with many other characters of the "Key" it is not a strictly comparative treatment.

Grose and Zimmer (1958) in their work on the seed of the Victorian eucalypts were concerned mainly with descriptive morphology, and the seed of each species are dealt with in the order of Blakely's classification. There is little speculation as to the correctness of Blakely's groupings and they suggested that "species with similar seeds and chaff generally have similar types of anthers."

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They recognised the heterogeneity of seed types in Blakely's Macrantherae from which Section they discussed three species of the Dumosae, viz., *E. dumosa*, *E. incrassata* and *E. angulosa*. In their discussion of the Dumosae, they incorrectly stated that the seed of *E. incrassata* are very similar to those of *E. dumosa* (discussed later).

Gaubia and Pryor (1961) were concerned mainly with seed coat anatomy. On anatomical as well as morphological grounds they considered there to be a close similarity between the seed of *E. tetraptera*, *E. erythrandra*, *E. forrestiana* and *E. stoatei*. Of these *E. stoatei* is the only one included in the Dumosae in the second and third editions of Blakely's "Key" (1955, 1965).

Carr and Carr recognised four seed categories within the Dumosae. Only one (which includes *E. dumosa*) corresponds exactly with any one of Maiden's, viz., the Series Rufispermae which Maiden based on the single species *E. woodwardii*.

It seems necessary, therefore, to reconsider Blakely's grouping of species in the Series Dumosae in the light of the additions and exclusions suggested by several workers. Varieties have not been considered and nomenclature is in accordance with Johnston and Marryatt (1965). *E. erythrandra* has been considered, although a putative hybrid, because of its importance in relating two groups of species.

Collection and Examination of Specimens

All but two or three species of the Dumosae and the related species are indigenous in Western Australia and those whose type localities are in Western Australia have been collected in that State. *E. incrassata* was collected in both Western Australia and New South Wales. *E. anceps* and *E. conglobata* which occur in both Western Australia and South Australia and whose type localities are in South Australia have been collected near Hopetoun (W.A.). *E. dumosa*, which does not occur in Western Australia, was collected in south-western New South Wales. *E. brachycalyx*, *E. erythrandra*, *E. oraria*, *E. pimpiniana* and *E. rugosa* were not seen by the author in the field and information on them has been obtained from the examination of herbarium material and from the work of Carr and Carr.

Specimens were examined particularly for stamen, cotyledon, and seed characters, and for the presence of pith glands—a character whose importance in eucalypt taxonomy was shown by Carr and Carr. Also noted but regarded as being of lesser taxonomic value were leaf, bud and fruit characters.

E. dumosa and its Allies

The first species of the Series Dumosae to be described were *E. incrassata* (1806) and *E. dumosa* and *E. angulosa* (1843). These three taxa (*E. angulosa* as *E. incrassata* var. *angulosa*) were classified by Bentham (1867) in the Series Normales, Subseries Robustae, together with *E. tetraptera*. The remainder of the species in the Subseries Robustae are quite unrelated to the Dumosae. *E. dumosa*, *E. incrassata* and *E. angulosa* were included by Blakely in his Series Dumosae and *E. tetraptera* in the Series Tetraptera. If the intention is to erect a taxon based on *E. dumosa*, it is possible to compile a list of species which are closely related to *E. dumosa* on three basic morphological grounds—features of the stamens, cotyledons and seeds.

The "*dumosa*" group

The anthers of *E. dumosa* are versatile, subbasifixed, moderately large, rather angular, broad, more or less truncate at the top, tapering below, opening by parallel slits. The filaments in the unopened bud are all erect, then flexed downwards and inwards radially with the anthers resting on the top of the

ovary, or with the anthers finally deflected radially outwards and then with their tops against the upper tubular part of the hypanthium. The cotyledons are reniform. The seed are fairly flat or lenticular by dorsiventral compression. The testa is red-brown, lustrous, shallowly pitted, striate with the hilum ventral, central, and not distinctly coloured.

Species which have the same characters are *E. anceps*, *E. clelandii**, *E. conglobata**, *E. dongarraensis*, *E. dumosa**, *E. kondininensis*, *E. lesouefii*, *E. pileata*, *E. sheathiana*, *E. striaticalyx**, and *E. woodwardii*.*

As a group these species show no constant features of the habit, bark, leaves, peduncles, pedicels and bud morphology, which would make it easy to segregate them as a group within the Section Macrantherae. Similarly, between species these features are not always reliably contrasting, although they have been frequently used as key characters as in Bentham (1867), Ewart (1930), Blakely (1934, 1955, 1965) and Burbidge (1947). Burbidge, however, commented on the difficulties in the taxonomy of the species of the Dumosae which occur in South Australia.

The species above are centred on *E. dumosa* according to seed characters—and should comprise the Series Rufispermae which Maiden (1929) based on *E. woodwardii*. A further character which these species have in common is pith glands.

*Maiden included these species in the "Division" Bilobae. The cotyledons of the remainder were not classified by him. It is considered, however, that the cotyledons of all the species relevant to the Dumosae are better described as reniform.

The "corrugata" group

The remainder of the species of the Macrantherae which have reniform cotyledons and the staminal features of *E. dumosa* and which have pith glands have seed distinct from those of the Rufispermae. Carr and Carr place them in two seed categories. One group has seed which are "not winged, and the testa is black or dark grey with deep, sharp-edged pits". This group "centres on *E. corrugata* and includes *E. griffithsii*". To these should be added *E. comitae-vallis*, *E. concinna*, *E. leptocalyx**, *E. melanoxylon*, *E. platycorys*, *E. rugosa*, *E. scyphocalyx*, and *E. torquata*. The group shows a tendency for the reduction in flower number per inflorescence from an average of seven in *E. comitae-vallis* to three in *E. griffithsii* and *E. corrugata*. Specimens of *E. platycorys* may be three or seven flowered. In contrast, the inflorescences of the species of the Rufispermae are usually seven or eleven flowered, except *E. woodwardii* which may be three flowered.

The "ovularis" group

The second group of Carr and Carr is characterized by brown wingless seeds and shallow pitting of the testa and includes *E. cylindrocarpa*, *E. oraria*, and *E. ovularia*. These species show a tendency for more delicate flower parts compared with the species of the other groups. *E. dundasii* which was placed by Blakely in the Dumosae has affinity with this group in many characters. The cotyledons of this species are bilobed, however, and this character sets it apart from the Dumosae in the way the taxon is interpreted in this survey.

The ovule arrangement for the species of the three "seed" groups is similar to that of those other species in the genus which have four rows of ovules of which the basal ones and those of the outer rows except the upper ones contain embryo sacs and are presumed to be potentially fertile. The ovules at the top of the placenta and those of the inner two rows except the basal ones are non-fertile.

*Carr and Carr included *E. leptocalyx* "tentatively" in the "incrassata" seed group. The two groups are closely related and observations on more material will have to be made before *E. leptocalyx* can be correctly assigned.

The "incrassata" group

Three species of the Macrantherae, which have reniform cotyledons and the staminal features of *E. dumosa*, are not consistently glandular in the pith (Carr and Carr), viz., *E. angulosa*, *E. erythrandra*, and *E. incrassata*. However, in their external floral morphology they have affinity with *E. platycorys*, and it is reasonable to include them in the Dumosae. Their seed are considerably different from those of the "corrugata" and "ovularis" groups and even more different from those of the Rufispermae. The seed are black, circumferentially winged, more or less pyramidal with ridges ascending to the hilum which is usually whitish and distinct. These seed correspond in part to those of Series Kochioides and Series Heteroptera of Maiden (1929). The ovule arrangement of *E. incrassata* is the same as for the species of the first three groups. *E. angulosa* is variable with one or two extra rows of potentially fertile ovules. *E. erythrandra* has not been examined.

Three more species, *E. forrestiana*, *E. stoatei* and *E. tetraptera*, which are lacking in pith glands have similar seed morphology to the "incrassata" group. From the anatomy and morphology of the seed, Gauba and Pryor considered these species to be closely related to *E. erythrandra*. While the three species have affinities with the Dumosae there are grounds for considering them apart. Compared with the species of the Dumosae, the buds are large, consistently pendulous, and reduced in number to one per inflorescence. The anthers are less angular which may be due, in the larger buds, to there being less pressure of the tops of the anthers against the wall of the upper part of the hypanthium. The placentae are large with many ovules. *E. forrestiana* has 6-8 rows of ovules. *E. stoatei* and *E. tetraptera* have 8-10 rows. Only the two inner rows in each case are non-fertile. At present it is convenient to classify these species in the Dumosae whilst recognizing that they deviate in bud size, anther shape, and placental characters.

Because of morphological similarity, between *E. incrassata* and *E. platycorys* and between *E. cylindrocarpa* and *E. leptocalyx* the three latter seed categories may be inter-related.

The species relevant to this survey and their important characters are summarised in Table I.

Discussion of species recommended for exclusion from the Dumosae

While it is suggested that seven species be excluded from the Dumosae, their true affinities are not clear in all cases. Maiden (1929) quoted C. A. Gardner as saying that *E. desmondensis* was close to *E. redunca* (Subcornutac). This is confirmed by observations on seed morphology. Both species have whitish to light grey-brown subspherical, unsculptured seed which are unique to the Series Subcornutac among the seed of Western Australian species.

E. diptera has distinctive seed and many other features in common with the gimlets and should be included with *E. salubris* in the Series Contortae. Maiden (1929) and Carr and Carr recognized the affinity of *E. diptera* with *E. salubris* and *E. campaspe*.

E. trivalva was tentatively classified as having some affinity with *E. dumosa* (Blakely 1955, 1965). The type locality is Queen Victoria Spring, Western Australia, where it is not known to have been collected since its discovery in 1891. Specimens which agree reasonably with the type description have been collected and tested from several other localities, viz., Wiluna, the Hamersley Range and the Blackstone Range in Western Australia, and the George Gill Range in the Northern Territory. The seedlings have bisected cotyledons similar to those of *E. dundasii* and consequently the specimens tested do not belong to the Dumosae. However, there must be reservations on the classification of *E. trivalva* until the species is sampled again from the type locality.

Gardner (1961) considered there was some natural affinity between *E. dongarraensis* and *E. accedens*. Collections of *E. dongarraensis* have been made

TABLE 1

Series (Blakely)	Species	Cotyledons (1)	Seeds (2)	Pith Glands (3)	Designation (4)
Tetrapterae	<i>tetraptera</i> Turcz.	...	...	—	included
	(5) <i>erythrandra</i> Blakely & Steedman	...	4	±	included
Obliqueae	<i>woodwardii</i> Maiden	...	...	+	included
	<i>griffithsii</i> Maiden	...	1	+	included
Dumosae	<i>sheathiana</i> Maiden	...	2	+	retained
	(6) <i>accedens</i> W. V. Fitzg.	...	1	+	excluded
	<i>desmondensis</i> Maiden & Blakely	...	...	...	excluded
	<i>loxophleba</i> Benth.	...	bisected	...	excluded
	(7) <i>oraria</i> L. A. S. Johnson	...	bisected	...	retained
	<i>comitae-vallis</i> Maiden	...	reniform	+	retained
	<i>cylindrocarna</i> Blakely	...	reniform	+	retained
	(8) <i>dumilasi</i> Maiden	...	reniform	+	retained
	<i>incrassata</i> Labill.	...	bilobed	...	excluded
	(8) <i>scaphocalyx</i> (F. Muell. ex Benth.) Maiden & Blakely	...	reniform	4	retained
	<i>diptera</i> Andrews	...	reniform	2	retained
	<i>conglobata</i> (R. Br. ex Benth.) Maiden	...	bisected	±	excluded
	<i>anceps</i> (R. Br. ex Maiden) Blakely	...	reniform	+	retained
	<i>dumosa</i> A. Cunn. ex Schau.	...	reniform	+	retained
	<i>trivahia</i> Blakely	...	reniform	+	retained
	<i>leptocalyx</i> Blakely	...	bisected	...	excluded
	(5) <i>brachycalyx</i> Blakely	...	reniform	2	retained
	<i>pilcata</i> Blakely	...	reniform	not avail.	retained
	<i>rigosa</i> (R. Br.) Blakely	...	reniform	1	retained
	<i>dongarraensis</i> Maiden & Blakely	...	reniform	2	retained
	<i>striatocalyx</i> W. V. Fitzg.	...	reniform	1	retained
	<i>kondininensis</i> Maiden & Blakely	...	reniform	1	retained
	<i>platycorys</i> Maiden & Blakely	...	reniform	1	retained
	<i>conchina</i> Maiden & Blakely	...	reniform	2	retained
	<i>corrugata</i> Luehm.	...	reniform	2	retained
	<i>clelandii</i> Maiden	...	reniform	1	retained
	<i>lesouefii</i> Maiden	...	reniform	2	retained
	<i>goniantha</i> Turcz.	...	reniform	1	retained
<i>torquata</i> Luehm.	...	bisected	...	excluded	
<i>anzulosa</i> Schau.	...	reniform	2	retained	
<i>stoatei</i> C. A. Gardn.	...	reniform	4	retained	
Anisomelae	(5) <i>pinipiniata</i> Maiden	...	4	+	included
	<i>ovularis</i> Maiden & Blakely	...	3	+	included
Exsertae	<i>melanoxylon</i> Maiden	...	2	+	included
Quadrilocostae	<i>forrestiana</i> Diels	...	4	—	included

which agree with the type description and with an isotype in the Western Australian Herbarium. Tests on this material show that *E. dongarraensis* has reniform cotyledons. *E. accedens* has bisected cotyledons and on this basis has no affinity with *E. dongarraensis*.

E. goniantha belongs to the Series Decurvae. Maiden (1914) recognized its relationships when he stated that this species had a close affinity with *E. falcata*.

Johnson considered that *E. loxophleba* was related to *E. oraria*. The two species have quite different cotyledons and the natural affinities of *E. loxophleba* remain undetermined.

Acknowledgements

Thanks are due to Mr. J. Maconochie for seed of *E. trivalva* from the Northern Territory and to Mr. C. Boomsma for seed of *E. pileata* and *E. rugosa* from South Australia.

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Notes to Table 1.

- (1) Cotyledons are classified according to Maiden's concepts (1933). A difference in interpretation has been discussed earlier.
- (2) Seeds are numbered as belonging to one of four categories as discussed above—1 refers to the "dumosa" group, 2 refers to the "corrugata" group, 3 refers to the "ovularis" group and 4 refers to the "incrassata" group.
- (3) Information on pith glands is derived basically from Carr and Carr and no discrepancies were found in this survey.
- (4) Species designated "retained" are those included by Blakely in the Series Dumosae which should be retained. Seven species of Blakely's Series are recommended for exclusion ("excluded") and eight others are recommended for addition ("included") to the Series.
- (5) Information on *E. erythrandra*, *E. brachycalyx* and *E. pimpiniana* has been obtained from Carr and Carr.
- (6) The recently-described *E. laevis* Podger and Chippendale (1969) has bisected cotyledons and is excluded along with *E. accedens* with which it has affinity.
- (7) The distinction between *E. oraria* L. A. S. Johnson which has reniform cotyledons and *E. foecunda* Schau. which Maiden correctly placed in the Bisectae while apparently confusing the two taxa was clarified by Johnson (1962).
- (8) Carr and Carr stated that both *E. dundasii* and *E. scyphocalyx* have bisected cotyledons. Observations show the cotyledons to be bilobed and reniform respectively.

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